Technology Innovation

Instructor: Travis J. Brown (trabrown@indiana.edu)
Office Hours: By appointment (Informatics West 209)
Class Times: Tuesday, Thursday – 8:00am-9:15am
Class Location: Informatics West 107
Associate Instructor: Alexander Hoffmann (almahoff@iu.edu)

Course Description
This course will teach students the process of innovation, specifically in respect to technological innovation. Students will be required to ideate technological concepts given a set of constraints and an opportunity space. The focus of the course will be for students to invent and implement without considering the commercial potential of their innovations. Concepts covered will include abductive reasoning, problem framing, pattern recognition, and trend analysis. Students will be required to rapidly prototype their concepts in order to present their innovations in class. The class will culminate in an innovation competition, which will entail students completing an innovation challenge and presenting their solutions to a panel of judges who will evaluate their technologies based on the depth of innovative thinking demonstrated.

Course Goals and Objectives
Successful students in this course will be able to:
1. Distinguish innovation from creativity through learning to practice both.
2. Analyze the factors which led to past innovations in order to leverage them for future innovations.
3. Recognize and dissect patterns in order to more effectively develop innovative technologies.
4. Identify shifts in social behavior, government policy, and technological advances in order to better anticipate emerging trends and new opportunities for innovative solutions.
Readings
While I will be teaching from the following book and you will likely find it useful when thinking through your innovation process, you are not required to purchase it:


You might also find these books useful:


Structure
You will be required to complete projects, each with an individual and a team component, according to the innovation themes discussed in class. There are a total of 5 projects, with the culmination of the course being the presentation of the final innovation project completed at the end of the course.

Lectures
We will cover new material and discuss the new assignment. Assignment instructions will be posted on Canvas prior to each lecture. Lectures will focus on innovation techniques and methods, specifically focusing on the 4 lenses of innovation presented in the course.

Individual Presentations & Critiques
You will present the innovations you build throughout the course in class to solicit critiques from the instructor and your classmates. You will be expected to explain your inspiration for your innovation, your development process, why you consider your solution to be innovative rather than simply creative, and who you think would derive the most benefit from using your innovation.
Grading

Projects
There are 5 innovation projects organized in 5 themes. For each project, you will be responsible for submitting a personal reflection through which you will be expected to discuss what you have learned from the readings, the speakers, and the process of honing your innovation skills. Completed assignments are to be submitted via Canvas by the assignment deadline. The point allocation for the course is as follows:

Innovation Project 1 * 100 points + Innovation Projects 2-5 * 150 points = 700 points

Technology Trend Report & Presentation
I590 Students Only: You are required to complete a report and presentation on one of four technological trends, as selected by the class. Your analysis should include the current state of the field, the primary players in the field, and the prominent developments at this point. Additional instructions will be provided in class.

Report & Presentation = 100 points

Attendance & Participation
Attendance is critical to this type of course structure. Accordingly, attendance is MANDATORY to all classes, and attendance will be taken during class. Attendance means being present, which entails actively listening, participating in class discussions, and providing design critiques during presentations; if you’re not present, you didn’t attend class and will be counted absent. There are 100 points allotted for attendance. You are allowed exactly two absences without penalty. Otherwise, you will lose points as reflected in the following table for each absence unexcused by University policies:

<table>
<thead>
<tr>
<th>Number of Absences</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>95</td>
</tr>
<tr>
<td>4</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>More than 7</td>
<td>0</td>
</tr>
</tbody>
</table>

The total number of possible points awarded during the class is 800 for I400 students and 900 for I590 students:

<table>
<thead>
<tr>
<th></th>
<th>I400</th>
<th>I590</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projects</td>
<td>700</td>
<td>700</td>
</tr>
<tr>
<td>Trend Presentation</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Attendance &amp; Participation</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>800</td>
<td>900</td>
</tr>
</tbody>
</table>

The percentage of the points received will not be rounded off and will be used to assign a letter grade as follows (e.g., 867 out of 1000 = 86.7% = B):
<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>97 - 100</td>
</tr>
<tr>
<td>A</td>
<td>93 - &lt; 97</td>
</tr>
<tr>
<td>A-</td>
<td>90 - &lt; 93</td>
</tr>
<tr>
<td>B+</td>
<td>87 - &lt; 90</td>
</tr>
<tr>
<td>B</td>
<td>83 - &lt; 87</td>
</tr>
<tr>
<td>B-</td>
<td>80 - &lt; 83</td>
</tr>
<tr>
<td>C+</td>
<td>77 - &lt; 80</td>
</tr>
<tr>
<td>C</td>
<td>73 - &lt; 77</td>
</tr>
<tr>
<td>C-</td>
<td>70 - &lt; 73</td>
</tr>
<tr>
<td>D+</td>
<td>67 - &lt; 70</td>
</tr>
<tr>
<td>D</td>
<td>63 - &lt; 67</td>
</tr>
<tr>
<td>D-</td>
<td>60 - &lt; 63</td>
</tr>
<tr>
<td>F</td>
<td>0 - &lt; 60</td>
</tr>
<tr>
<td>Week</td>
<td>Dates</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| 1    | AUG 22  
AUG 24 |          | Lecture: Introduction & Course Overview | Innovation Show & Tell |
| 2    | AUG 29  
AUG 31 |          | Making at IU: Christian Mckay, Coordinator of Maker  
Space, CREST | Class Presentations  
Due: IP1 |
| 3    | SEP 5  
SEP 7 |          | Lecture: Challenging Orthodoxies  
Internet of Things (IoT) |
| 4    | SEP 12  
SEP 14 |          | Concept Review, Evaluation, & Selection  
Due: IP2-Individual | Innovation Exercise  
“Challenging Orthodoxies” |
| 5    | SEP 19  
SEP 21 |          | Class Presentations  
Due: 4LOI - Part 3: Challenging Orthodoxies &  
IP2-Team | Class Presentations |
| 6    | SEP 26  
SEP 28 |          | Lecture: Harnessing Trends  
Assigned: 4LOI - Part 3: Harnessing Trends & IP3 | Trend Presentation – M. Brennan:  
Augmented Reality/Virtual Reality |
| 7    | OCT 3  
OCT 5 | Fall Break  
OCT 6-8 | Concept Review, Evaluation, & Selection  
Due: IP3-Individual | Innovation Exercise  
“Harnessing Trends” |
| 8    | OCT 10  
OCT 12 |          | Innovation Showcase & Judging  
Due: 4LOI - Part 3: Harnessing Trends | Finalist Presentations  
Due: IP3-Team |
| 9    | OCT 17  
OCT 19 |          | Lecture: Leveraging Resources  
Assigned: 4LOI - Part 3: Leveraging Resources & IP4 | Trend Presentation – S. Stephens:  
Wearables & Biometrics |
| 10   | OCT 24  
OCT 26 |          | Concept Review, Evaluation, & Selection  
Due: IP4-Individual | Innovation Exercise  
“Leveraging Resources” |
| 11   | OCT 31  
NOV 2 |          | Innovation Showcase & Judging  
Due: 4LOI - Part 3: Leveraging Resources | Finalist Presentations  
Due: IP4-Team |
| 12   | NOV 7  
NOV 9 | IP Protection Primer: Norman J. Hedges, Clinical  
Associate Professor of Law & Director, Intellectual  
Property Law Clinic | Lecture: Understanding Needs  
Assigned: 4LOI - Part 3:  
Understanding Needs & IP5 |
| 13   | NOV 14  
NOV 16 |          | Concept Review, Evaluation, & Selection  
Due: IP5-Individual | Innovation Exercise  
“Understanding Needs” |
| 14   | NOV 28  
NOV 30 |          | Final Presentation Discussion | Project Work Day |
| 15   | DEC 5  
DEC 7 | “Free Week”  
Due: 4LOI - Part 3: Understanding Needs | Innovation Showcase & Judging  
Due: 4LOI - Part 3: Understanding Needs |
| 16   | DEC 11-15 |          | Final Exam Week (NO EXAM) | |

Thanksgiving  
NOV 18-NOV 26
Timeliness
Timeliness is critical in professional settings. Managers and clients don’t like to pay for work that’s turned in late, and they aren’t interested in hearing about why something is late. Start early and manage your projects so that you have plenty of time at the end to deal with unexpected surprises.

Doing Your Own Work and Sharing and Attributing Others
In the real world, it is important to build on the work of others. When you present or submit your work, you need to be prepared to give an account of what part of a concept or research is your own work and which part was inspired or informed by the work of others. You must properly attribute the work of others.

If you use the work of others without attribution and acknowledgement, you will be subject to academic sanctions concerning plagiarism with all deliberate intent. Acts of plagiarism—using the work of others without attribution or reusing your own work without attributing prior use—will be subject to a zero-tolerance policy in this class. If you believe that someone else in the class has used your work without attributing you, please talk to the instructor or one of the AI’s.

Digital Photography & Other Tools
IU has worked out a special licensing arrangement with Adobe and students can now download the latest Adobe software suites from http://iuware.iu.edu using your student IU login for your own educational use.

There are a lot of Adobe software tools worth mastering. You are expected to learn these tools on your own using the instructions that come with the software or any of the myriad of self-tutor resources available online, but this class is an opportunity to learn-by-doing in practicing your use of these tools.

Academic Misconduct
The class is morally and procedurally bound by IU’s policies on academic misconduct, the details of which you can read about at the following website: http://www.indiana.edu/~code/.

Religious Observance
In accordance with the Office of the Dean of Faculties, any student who wishes to receive an excused absence from class must submit a request form available from the Dean of Faculties for each day to be absent. This form must be presented to the course professor by the end of the second week of the semester. A separate form must be submitted for each day. The form must be signed by the instructor, with a copy retained by the instructor, and the original returned to the student. Information about the policy on religious observance can be found at http://teaching.iub.edu/policies_religious.php?nav=policies.

English
If English is not your native language or you are otherwise shy about speaking in class, please do not worry. You will not be penalized in any way for making contributions to the class in less than perfect English or for taking time to compose your answers. The instructor will frequently emphasize to the class the need for all of us to be supportive of each other when it comes to contributing to the discussions. There is no need to feel rushed when responding to questions in class—an important part of the class is the construction of a feeling of community with the faculty, the AI’s, and your peers. You are
encouraged to utilize the free writing tutorial service provided by the university. You can learn more about it at http://wts.indiana.edu/

**Laptops**
In order to encourage you to read on screen, rather than print the resources out on paper, you will be permitted to use laptops in class. The expectation is that you will use the laptops to look up things that are relevant to class. Please do not use the laptops to do things that are not related to the class. If the AI or the instructor notices that you are doing things on your laptop unrelated to the class, you may lose your attendance points for that day.