Industrial Blueprint

-The IOE Student Newsletter-

Undergraduate Walk-In Counseling Hours

Professor Yili Liu (Program Advisor):
Wednesdays: 2-3:00pm & by appointment
In G622 IOE
E-mail: yililiu@umich.edu
Phone: 763-0464

Justina Chiang (IOE/EGL Peer Counselor):
Mondays: 3-4pm
Tuesdays: 11am-1:30pm
Wednesdays: 3-5pm
Fridays: 12:30-3pm
In 1749 IOE
E-mail: jlchiang@umich.edu

Kristen Neubauer (IOE/EGL Peer Counselor):
Mondays: 10am-3pm
Thursdays: 10am-2pm
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Pedro Vaz (IOE/EGL Peer Counselor):
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Thursdays: 2-5pm
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Upcoming Events

October 31	Halloweeeeeen!
November 4	Graduate Info Day
November 6	Tech Day 2005
November 14	Second Half-Term Drop Deadline

A Few Words From the Editor . . .

Welcome to the October edition of the Industrial Blueprint! The weather's getting colder but (some) students are in full steam as the school year passes the half-way mark. Some of us are just waking up...

This edition of the Blueprint features the usual fix of course reviews, internship reviews, and random IOE information.

We are also re-instating the "back page" of the Blueprint – possibly the most read page of any given Blueprint. We also have shortened the length of the Blueprint this month; hopefully we've done a good job in replacing quantity with quality and reducing non-value added work.

Finally, with registration coming up in a month (I know, long time from now right), expect the next issue to come out in about the third week of November with a large feast of course re-views, IOE and non-IOE alike. Mmmm, feast...

Final obligatory note:
If you would like to see something in the next or future issues of the Industrial Blueprint, please let our fine and wonderful Blueprint staff know what you think. You can e-mail the edi-tors at IOEBlueprintGroup@umich.edu.

Have a nice day,
Franklin.

Visit the IOE Department Website:
http://ioe.engin.umich.edu/ugrad.html

IOE Student Societies

Alpha Pi Mu (APM)
http://www.engin.umich.edu/soc/apm

Engineering Global Leadership (EGL) Honor Society
http://www.engin.umich.edu/students/support/egl/

Human Factors and Ergonomics Society (HFES)
http://www.engin.umich.edu/soc/hfes

Institute of Industrial Engineers (IIE)
http://www.engin.umich.edu/soc/iie

Institute for Operations Research & the Management Sciences
http://www.engin.umich.edu/soc/informs

Outstanding Multicultural Industrial Engineers (OMIE)
http://www.engin.umich.edu/soc/omie/

-The One True Love of my Life-
The IOE Building

Ergo-what-ics Con-who-ing?

By Steven Agacinski

A small, specialized team called in when local forces can't get the job done, preventing harm, changing the world from the top-down confidentially, seeing new sights, meeting new people, and asking the important questions to have both short and long term impacts. That's right; obviously I am talking about the field of ergonomic consulting.

Anybody in the IOE department can tell me about my potential future: the lean manufacturing, corporate business models, and Six Sigma practices that await me. But what about those other courses, the world of an IOE outside of statistics or optimization? The field of ergonomics exists in a far more substantial way in our lives than IOE 333 and 334, and there is a potential future for some in ergonomic consulting.

Recently, the HFES (Human Factors and Ergonomics Society) was host to Frank Lardi, an Associated Ergonomics Professional from the ergonomic consulting corporation Humantech, Inc. Humantech is one of a small, but growing number of ergonomic consulting groups in America constantly on the search for engineering solutions rather than new administrative work practices. A small sampling of some of the many corporations includes John Deere, IBM, Tyson, Miller, Pepsi Bottling Group, Denso – the list just keeps going. Ergonomic consulting starts with basic questions: "Is there a problem?", "How bad is it?", "Where do I start?", and "What do I do about it?" From there, the ergonomic consultant relies on tools of the trade, such as charts, data, specifications, and physical limitations, in order to fully develop a solution to a selection of ergonomic problems faced by a company. These solutions come in all forms, ranging from high tech, vastly expensive programs, to tiny in-house adjustments such as creating an inclined table. These effects are measured through both short term benefits of risk reduction and long term benefits of injury reduction.

But don't worry, IOE hard-liners. This field is increasingly relying on all IOE ideas. Lean manufacturing and Six Sigma have increasing importance in this field as companies try to increase productivity without sacrificing cost and eliminate non-value added tasks. What's next in the field of ergonomics consulting? Who knows, but you could always be on the ground floor of the next major change in ergonomics in the world! If you are interested in ergonomics and human factors, check out our own HFES website: http://www.engin.umich.edu/soc/hfes/.

Bored? Between the hours of 1:30 and 3:30 on Wednesday?

If so look for Steve Agacinski in the IOE Student Lounge, accepting all visitors during an awkward 2 hour break in his day. He's dubbing these "open office hours" despite a lack of affiliated organization, administrative approval, or true purpose. Talk about life, the world, school, whatever! Maybe you'll be even be mentioned in an up-coming article.
Note: Steven Agacinski is not accredited by any organization to discuss any topics of substance

To Be or Not To Be: Abbott Internship Review

By Alexander Johnson

Many people wonder what the role of an Industrial and Operations Engineer in industry would be like. In fact, many people wonder about the role of an Industrial and Operations Engineer in general. I'd like to describe what my IOE internship experience was like at Abbott Laboratories.

This past summer I was a manufacturing intern at Abbott Laboratories in Waukegan, Illinois. For those of you non-geography majors, Waukegan is about 45 minutes north of Chicago. I worked in their diagnostics division in Fill/Label Manufacturing. Much like the name implies, in that department, we fill and label commodities (usually vials of solution used for diagnostic testing). The process was semi-automated and required operators to run the factory lines. There were roughly 20 or so factory lines in my department, each capable of running different types of commodities.

I was assigned to the Business Project Improvement (BPI) team for my department. Each department within the Abbott Diagnostic Division had a BPI team responsible for implementing lean manufacturing initiatives. I was given the role of project manager for two of our initiatives. I had complete control over both projects from the ground up. After familiarizing myself with the factory lines and determining the scope of the projects, I began to lay out my project path. I had to design and implement metrics for tracking the current state of each project in order to determine where improvement was possible. I then assembled a cross-functional team to begin the implementation process. I wrote two brand new procedures that would be placed into the official manufacturing protocol. The adoption of these new procedures streamlined the current processes and had an estimated cost savings of over $300K annualized.

The work I did this summer was meaningful, critical-to-business, and challenging. I was able to work on a real project that actually made a difference. I had the chance to speak at the Abbott corporate information session and was informed that both of my projects are "live." The work I had done over the summer is still being implemented, which goes to show the importance of the role of an Industrial and Operations Engineer.

What were you this Halloween? Send costume ideas to IOEBluePrintGroup@umich.edu. The best costume will be voted on, and the winner will win a prize of our choosing. Which may be free pizza. Or nothing.

A History of Industrial Engineering

By Sarah Zarowny

The discipline of industrial engineering is a product of the Industrial Revolution. Long ago, before 1610 IOE was even a twinkle in some University administrator's eye, factories filled with machines began to replace small craft shops and a need for the organization and management of work grew. Individuals such as Frederic Taylor (1856-1915) saw an opportunity for the application of scientific principles to factory labor.

While Frederic Taylor was the first to attempt to break each action performed in the factory down to its basic components, and then construct the most efficient process, many did not appreciate his work as the beginnings of a new profession, but instead felt that Taylor's methods were dehumanizing and aimed at squeezing the most out of workers without regard for their well-being. In the early 20th century, Frank and Lillian Gilbreth (best known in popular culture as the parents in *Cheaper by the Dozen*) began to pioneer the field of ergonomics with the invention of time studies. The Gilbreths claimed that their aim was to discover how to best arrange the work so as to improve performance while reducing the harm to the laborer and making the job easier to perform. Since this time, industrial engineering has attempted to integrate the desire for efficiency with the well-being of the laborer.

Industrial engineering grew throughout the early 20th century as the American economy relied on manufacturing, providing improvements in the manufacturing process through the fields of ergonomics, management, and quality control.

Some important dates include:

1948 - The Institute of Industrial Engineers (IIE) was founded to advance the new profession

1949- Alpha Pi Mu, the only nationally recognized industrial engineering honors society, was formed at Georgia Institute of Technology

1956 - Industrial Engineering was adopted as an independent department at the University of Michigan

With the dawn of the Information Age, accomplishing tasks with greater accuracy and efficiency has never been more important. Industrial engineering continues to rise to the challenge by expanding its previous emphasis on human-machine interaction to include the human-computer interaction.

Want more information? Here's a great site referenced for this article:
http://web.ca.neu.edu/~ewertheim/introd/history.htm#HR

Senior Design for IOEs

By Kristin Banker

As you may or may not know, each IOE student must complete a senior design course. There are four options*:

- IOE 424 Practicum in Production and Service Systems
- IOE 481 Practicum in Hospital Systems
- IOE 499 Senior Design Projects (EGL / by special arrangement only)

Other courses satisfying the design requirement, if approved by the undergraduate program advisor and with the consent of the course instructor. An important note is that internships and co-op assignments cannot count toward this requirement.

Now that you know what your options are, which one should you choose? As a student currently enrolled in IOE 481, I may be able to help. Both IOE 424 and IOE 481 have lecture once a week for 2 hours in the evening. Outside of these two hours, time is spent working on one of a variety of group projects. This time may be spent performing interviews and conducting time studies, collecting and analyzing data, drawing conclusions, and providing recommendations. For my project, we have weekly meetings with our project coordinator (who happens to be our professor) and client. IOE 481 also requires a project proposal, interim report, and final report; the other senior designs probably require similar technical communication with the client.

The differences between IOE 424 and IOE 481 are that the course content and projects have different focuses. IOE 424 focuses more on production and service systems (i.e. industry); IOE 481 focuses on hospital systems. All of the projects for IOE 481 are located somewhere within the University of Michigan Health System (UMHS). This is extremely convenient because transportation is not an issue; some of the IOE 424 projects are based more than two hours from Ann Arbor! If you are interested in health care or simply aren't interested in possibly working on a project based in a factory, IOE 481 may be right for you.

IOE 481 Course Objectives**

1. Provide real‑world experience conducting a professional project, which is performed in a healthcare organization, but useful in any industry.

2. Provide enough information and experience about the health care industry to help with a career decision.

3. Improve technical communication skills to facilitate future business interactions. These skills include writing reports and making presentations.
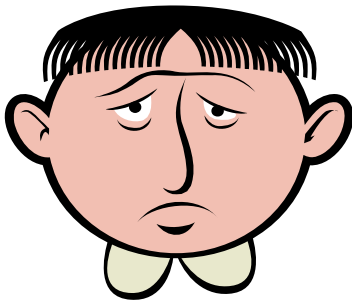
Information taken from:
*http://ioe.engin.umich.edu/degrees/ugrad/ugdocs/ioe_ugrad_stud_04-05.pdf
**http://www.engin.umich.edu/class/ioe481/coursepack/1bGeneralInfo.doc

Don't You Hate Blank Space? Take a stand against Blank Spaces everywhere!

Do your role to eliminate all the blank spaces in this world by submitting articles to:
IOEBlueprintGroup@umich.edu

An I-O-Efficient Halloween

By Steven Agacinski

I love Halloween, because I love candy. It's also a great night that allows everyone to do pretty much anything they want without anyone questioning them. Last Halloween, while outside Nichols Arcade, I watched as Batman descended from the roof to thwart a would-be mugger from attacking a poor girl. No joking. Talk about awesome!

My love of Halloween has inspired me to try to IOE-ize the glorious holiday to make it more efficient. There are several ways I have discovered to do this so as to optimize my time to fun ratio.

First, most people spend too much of their time trying to figure out a costume to wear. After excessively planning out different ways to make some ridiculous idea feasible, they give up and do what their friend did last year. However, they have ultimately been incredibly time-inefficient. Luckily, I've solved this problem. The best bet is to wait as late as possible and then go buy your costume from Meijer, Halloween Town, U.S.A., etc. You might be disappointed to find that all the "adult" costumes are gone, leaving only little kid costumes; but don't fret. The limited supply of costumes is your path to glory. This is your opportunity to be the 21-year-old man dressed up in an 8-year-old's Care Bears costume, or a 20-year-old woman sporting a 7-year-old's superman tights. Those things stretch more than you would imagine. And look at all the time you've saved by not even thinking about a costume. (Also, look into the return policy.)

Next: getting candy. Since we live in Ann Arbor, there are obvious limitations to our chances to get candy as some college students are completely unconcerned with the idea. Once again, I have the solution to the problem. Drive south. Hop in your car and head south of the University into the permanent residential areas of town until you see a large herd of young kids milling about on the street, going from house to house. These youngsters are unwittingly going to be your road to candy ecstasy. Get out of your car, and fall in a couple steps behind this group. Don't feel uncomfortable: in your little boy Mighty Morphin' Power Rangers outfit, you'll blend right in. These kids might slow you down slightly on your quest to get candy, but you can clue them in on the tricks of the trade: lights off = no candy, cutting across lawns = cool. The options are limitless. In the end, you'll find that your candy stock is huge. People might even take pity on you because apparently all your friends are 10 years younger than you. If anyone asks, just tell them you're collecting for your sick younger sibling. Who could possibly question that? It'll be a good deal in the end.

Finally, we come to the end of the Halloween night. Typically, college kids are always looking for the best party, and usually pretty unsuccessful at that. It's understandable because it's a big night. Everyone is too busy wandering around to actually consolidate in one place. Well, I have the best way to get around this. You are now the proud owner of an awe-inspiring candy supply. Who needs parties? Sure, hang out on the street for a while. Show off your sweet sweet store-bought children's costume. Talk to your friends. But ultimately, you don't need anyone. You can head home and sit in blissful solitude with your enviable new supply of candy with no regrets.

These are just some of the optimization methods I've learned to apply to Halloween. I understand that many of you won't be reading this until after Halloween, so just keep them in mind for next year. In the mean time, feel free to send any other efficient Halloween methods to spagaci@umich.edu. Stay tuned for ways to increase the efficiency of your next Flag Day, Armistice Day, and maybe even Thanksgiving.
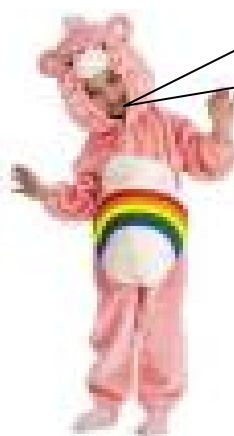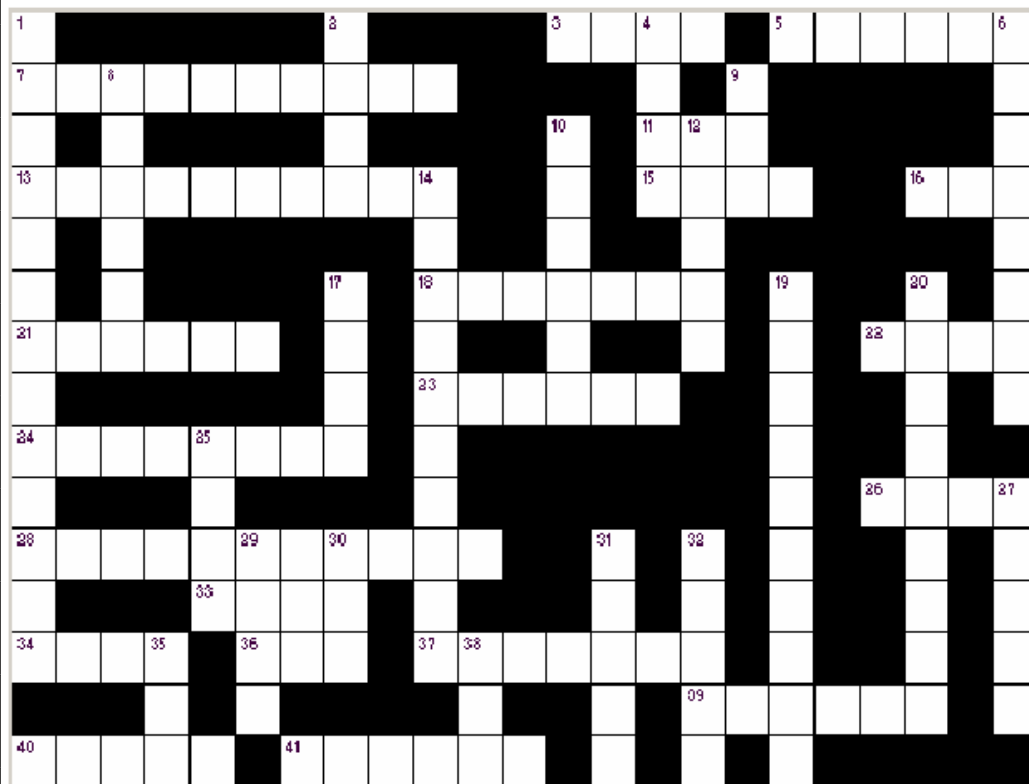
You wish you could look this good.

The Return of the Back Page

IOE Crossword

- It was my first try -

Down
1. Math 214 topic
2. Someone from New Zealand
4. Spots
6. Eastern African country bordered in part by the Red Sea
8. Baseball shelter
9. IOE student society
10. A sample of fabric
12. Search, expedition
14. Vitamin aid
17. Olfactory appendage
19. Tuba modified for marching band
20. Archduke Franz _____
25. To open (for caulking purposes)
27. "_____ my eggo"
29. B. School donator
30. IOE Honor Society
31. Peer Counselor Vaz

The next one will be more difficult — I promise
- Crossword Editor

Across
3. One who annoys
5. Participated in
7. Institute of _____ Engineers
11. Test of the inventory of one's emotional quotient
13. Human Factors
15. Canal through Egypt
16. Serving of corn
18. Detroit sports team
21. World Series contenders
22. Tau Beta Pi logo
23. UMEC president
24. Florida sports drink
26. University auditorium
28. Purdue mascot
33. Missouri (abbr.)
34. Inspiration for *Mama Mia*
36. Sea Level measurement
37. CoE event aimed toward prospective students
39. *Heart of Darkness* author Joseph
40. *Phantom of the Opera* composer
41. "Be Quiet!"