

Industrial Blueprint

-The IOE Student Newsletter-

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Brought to you by APM and IIE

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Upcoming Events

Thanksgiving Recess	November 25
Winter Break	December 24

Visit the IOE Undergrad Page:

<http://ioe.engin.umich.edu/degrees/ugrad/index.php>

A Few Words From the Editor . . .

Hello IOE,

Here we go again. Yes, it's time for your latest issue of the Industrial Blueprint. How have you been this past month? Good? Great.

Some things have drastically changed since the last issue. One of those is our football team's winning percentage. For all of you who are frantically searching for an answer to the question "What has happened to our team since our perfect 4-0 start?!?", I suggest you take a look at mgoblog.com. Mgoblog is THE place to get the latest inside information about our Michigan sports, particularly football, basketball, and hockey. *OK, great...and how is this related to the Blueprint...or engineering at all?* Well, it just so happens that Mgoblog was created by Brian Cook, a two-time Michigan Engineering graduate (bachelors and masters), who is now a full-time blogger. His style is funny, witty, and, unlike many other writers, he backs up all of his reasoning with research and statistics. This, I'm sure, is partly due to his U-M Engineering education. He is living proof that you really can do anything with an engineering degree from Michigan.

And now, on to *your* engineering thoughts, experiences, and ideas. In this issue we have some student-written course reviews, documented internship experiences, and advice on how to avoid catching the swine flu and stay healthy this winter.

Enjoy, and until next time, stay classy IOE.

Trevor Young

IOE Student Societies

Alpha Pi Mu (APM)

<http://www.engin.umich.edu/societies/apm/>

The only nationally accepted industrial engineering honor society, APM membership is based on GPA. All students with junior or senior standing are considered. APM sponsors numerous events every year; highlights from last year include the IOE Bar Crawl and IOE t-shirt sales.

Engineering Global Leadership (EGL) Honor Society

<http://www.engin.umich.edu/egl/>

EGL is a five-year program that combines engineering curriculum with courses in the Business school and LS&A, culminating in a Bachelor of Science degree and Masters degree in Engineering. EGL is designed to help students improve the bridge between business and engineering in industry, as well as give its members a cultural background to work in an increasingly global market. EGL is no longer an IOE/ME only honor society, but its membership features plenty of IOEs.

Human Factors and Ergonomics Society (HFES)

<http://www.engin.umich.edu/societies/hfes/>

Nationally, HFES is a professional society whose mission is to “promote the discovery and exchange of knowledge concerning the characteristics of human beings that are applicable to the design of systems and devices of all kinds.” The student chapter at Michigan leads multiple Center for Ergonomics lab tours and attends conferences throughout the year.

Institute of Industrial Engineers (IIE)

<http://www.engin.umich.edu/societies/iie/>

Another society with links to a national professional society, IIE’s main goal is to “provide an awareness of the Industrial and Operations Department and its resources” at Michigan. The student chapter acts as a conduit to the local Detroit IIE chapter and a networking hub for all IOEs at U of M. IIE sponsors plant tours and features corporate speakers at meetings.

Institute for Operations Research & the Management Sciences

<http://www.engin.umich.edu/societies/informs>

Outstanding Multicultural Industrial Engineers (OMIE)

<http://www.engin.umich.edu/societies/omie/>

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IOE Deserves Much Respect From the Engineering Community

By Sarah Han

If you are majoring in Industrial & Operations Engineering, chances are your fellow non-IOE engineer friend has made fun of you at some point. Even though I've only been an IOE for a little over a year, the number of derogatory comments I've gotten is, well, let's say more than I can count. The most memorable one was when I was talking to a representative from company "x" during career fair about my academic history. When asked for the reason why I switched into IOE, I said I found it more interesting and challenging than my previous career path. The representative then snickered and said, "Wait, IOE is challenging?"

I am not sure why I didn't just walk away from this extremely rude and unprofessional recruiter, but he did apologize for making the comment, admitting that he doesn't actually know what industrial engineering is. In my experience, I found this to be the key culprit in the lack of respect for us. Take this conversation that I overheard in a CEE 260 classroom, for example:

"Do you think civil is the easiest department here?"

"Nah, IOE's definitely the easiest."

"Oh yeah, I forgot about that. What do they do anyway?"

"I don't know, it's like working with factories and managers and stuff."

(The explanation was so bad that I don't exactly recall what was said)

"That's ridiculous. How is that even engineering?"

"Yeah seriously."

The stereotype for industrial engineering is so prevalent and rooted deeply among engineers. The only thing people know about IOE might be that it is "Instead of Engineering", and that doesn't even make sense at all since the definition of engineering includes applying scientific and mathematical knowledge to design and improve systems and processes. We need to educate others of all the valuable things industrial engineers do in order to establish respect for IOE. I don't know about you, but if I were one of those misguided people out there and found out that IOEs save companies millions of dollars for all the awesome stuff they do, I definitely wouldn't think it was "Instead of Engineering".

IOE 310 Review

By Chris Devins

Waking up for morning classes has never been one of my strong points. IOE 310 was one of the rare exceptions for me. If you're lucky enough to take this class with Prof. Amy Cohn, I guarantee you'll find the same thing. IOE 310 is titled "Introduction to Optimization", and it focuses on formulating mathematical models to represent real-life situations. Whether you are trying to figure out how many scoops of mint chocolate chip ice cream to have on hand at your ice cream store, or trying to create the optimal schedule for the Michigan football team, IOE 310 introduces a new way of thinking about a wide range of problems.

IOE 310 is a four credit class that is required for all IOE students. Ever feel like a professor is just teaching you straight from the book? Ever feel like going to some classes are a waste of time because you could teach yourself the same thing just by reading the book? This class is the exact opposite. Professor Cohn doesn't even have a required text, so you're actually getting customized content that she feels ex-

plains the material the best. She explains the topics in a way that you can actually understand. There isn't an attendance requirement, but if you don't go, good luck. You'd also be missing out on the occasional candy day, and let's be reasonable, candy is sweet.

Professor Cohn's class format consists of three exams, a weekly homework assignment, and a group project. The group project is a ton of work, but because you get to choose a topic on your own, it's not too bad if you pick a good one. The homework is tough but it isn't just busy work. If you spend a solid amount of time on it, the tests will be a lot easier. This isn't the type of class where you can just create a ridiculous sheet of notes for the exams and be fine. We all know that when you've got a class like that, you can leave the test absolutely clueless but still do fine. Whether or not this is a good thing for you, IOE 310 requires a complete understanding of the concepts in order to be successful.

How IOE Courses Apply to Real World Situations

By Reynold Wijaya

I spent 2 months this summer working as an intern at Indometal, a steel manufacturing company in Indonesia. It was a really nice experience and I learned a lot of things.

Since this company is still a very young company, they lack some experience and do not have a lot of employees. There are still a lot of aspects that are not efficiently applied. Therefore, they hired a lot of industrial engineering graduates to solve their problems.

I was assigned to a team of five, and our task was to find the optimal sizes of material to be produced. We were given a production target every day. Then we decided how to produce while using the fewest materials and residuals possible. Our team then developed a linear program, something that I learned from taking IOE 202, to decide how the materials should be used efficiently.

I was really happy because, not only did I help this company solve this problem, but I also was able to apply the IOE lessons that I have learned into the real world. I really enjoyed the internship program and look forward to facing new challenges in the future.

The Swine Flu

By Aristo Chang

I know we've all been receiving updates and emails on the influenza pandemic this semester, but as we enter colder weather, I thought I'd provide another public health announcement. So, in case you've been living in a cave for the past several months, here's an H1N1 review!

The major flu affecting society this season is a new strand of the H1N1 group, and is commonly referred to as "swine flu". H1N1 is a subgroup of Type A influenza, which is a highly adaptable and ever-changing disease. The new strand is composed of viruses that normally occur in North American, European, and Asian pigs, along with human and bird genes. The human immune system has very little protection against this contagious flu, which can spread the same way as the common seasonal flu.

The people who are most severely affected from catching swine flu are children and those up to the age of 19, pregnant women, people 50 years or older, and people with certain medical conditions such as asthma, heart disease, and a weakened immune system. However, most people will just experience mild illness and will not require any hospitalization.

Here are some tips to keep you healthy this winter:

- 1) Wash your hands
- 2) Avoid touching your eyes, nose or mouth
- 3) Stay away from those who are sick
- 4) Tell those who are sick to go home!

The following link is a good resource on the H1N1 pandemic, and contains important information for the 2009-2010 school year: <http://www.vpcomm.umich.edu/flu/>. Also, if you have any questions, you can always email fluquestions@umich.edu.

TARDEC Summer Internship Experience

By Jason Gargrave

This past summer, I was an engineering aid and technician at the U.S. Army Tank Automotive Research and Development Center (TARDEC) in Warren, Michigan. This was a great opportunity for me as I was able to gain valuable engineering-related job experience.

I was part of the Intelligent Ground Systems Department, and the scope of work for my summer project involved integrating a tele-operation system and mounting a mannequin on a Segway Robotic Mobility Platform to be used in pedestrian tracking/detection and safe operations efforts. This project was more focused on electrical and mechanical engineering rather than industrial engineering, but it was still very interesting. At the end of the summer, there was an expo where the summer employees had the opportunity to present the work they had accomplished.

Overall, the atmosphere is relaxed and the people who work there are friendly and helpful. There were also fun opportunities for the summer hires such as picnics and tours of the facilities. Although I did not do much industrial-engineering-related work, this summer experience was both enjoyable and rewarding.

The Differences Between SJTU and UM Students

By Yang Wang

Before transferring to the University of Michigan, I had spent my freshman and sophomore years in Shanghai Jiao Tong University (SJTU) in China. There are some interesting differences between two of the top engineering schools in each country. Sometimes I just wonder what the root cause of these differences is.

First of all, the academic atmosphere is totally different in class. American students like asking questions during the class and office hours. However, Chinese students usually work out the problem by themselves. If one has some difficulties, the first choice of Chinese students is to ask their peer classmates, not the professor. I have to admit, even I have been at UM for one year, and I am still the student of Chinese

type. Solving the problem by oneself is time consuming but is good for students to comprehend the content better. Asking the professor is much faster and can set up a better relationship with professor.

Out of the classroom, the differences between Chinese students and American students are even larger. I still am not used to the way that American students relax themselves. I live on central campus, and almost every day American students are having parties late into the night. I have teammates who had asked me why I do not go to club. I have never thought about going out late at night to party, and I do not find it to be that fun. In contrast, Chinese boys usually play computer games during their leisure time, such as World of Warcraft, Warcraft (Solo or Dota), or Starcraft. Chinese girls are more likely to see movies on their own computer during weekend.

Basically, most native Chinese students are not very social. They usually stay within a small group who always take classes together or play games together. Chinese students are somewhat introversive. American students are much more extroversive in many aspects. Both cultures have their differences and advantages.

IOE 333 Review

By Qiangzi Peng

IOE 333 is a fundamental class for ergonomics, which can also be called human factors engineering. In this class, Professor Yili Liu illustrated the relevance and importance of ergonomics, and the basic knowledge of identifying and solving ergonomics problems.

I learned a great deal through this class, since the content of ergonomics is interesting and it is very closely related to our daily life. For example, Professor Liu demonstrated the most appropriate height of the desk and chair when we are seated, and why we need to drink water frequently even when we are not thirsty. Now I adjust my seat height when studying in Duderstaht. Ergonomics also has many applications in several industries, like Nike (shoe designs following ergonomics principles), and Apple (ergonomic keyboard and mouse designs).

However, it is not easy to get high grades on exams and homework. Though there were only four assignments for the whole term, each one was very long and time consuming. However, the GSI was very helpful. So, make sure to attend office hours. There were several quizzes and three exams, and the third exam weighed the most. I personally think that it was hard to review for the exams, because there was so much material to review. The professor used a projector instead of Microsoft Powerpoint, so I needed to take notes quickly during class. Before the exam, I needed to review all of the notes and the contents in the textbook.

Overall, it's a worthy class, and Professor Liu is a really good professor.

ME 211 Review

By Courtney Murphy

As you all know, the industrial and operations engineering major requires you to take 3 non-IOE engineering courses in order to fulfill your requirements to graduate. As IOE majors, most of us do not look forward to these classes, as most often they are not things that interest us.

This semester I took ME 211 because it fit into my schedule well, and now I have found it to be a good choice. ME 211, officially titled “Intro to Solid Mechanics”, involves the study of statics, stress and strain, torsion, shear stresses, as well as other things. I found the majority of these concepts to be an extension of things that we learned in Physics 140. Having taken Physics 140 the previous semester, it was a great follow up class since I still remembered most of the general ideas from the course.

For IOE students who are trying to decide which of the non-IOE engineering courses to take, I would recommend taking this class immediately after taking Physics 140. There is only one homework assignment per week, which can be challenging but can prepare you very well for the tests. If you understand and can complete the homework, you will have no problem doing well on the tests. In fact, I found the tests to be rather easy.

Unfortunately, this may vary from professor to professor, but Prof. Wei Lu has fairly easy exams. If you do all of your homework, and turn it in on time, it isn't difficult to do well in this class. Another advantage is that missing the occasional lecture for an interview or meeting is not a big deal. Almost everything that he covers during class is straight out of the textbook.

There may be easier classes to take for your non-IOE requirement, but if you did well and understood physics 140, then I would definitely recommend this course.

Summer Experience in Ann Arbor

By Arthur Adisusanto

I spent my last summer staying in Ann Arbor for almost the whole three months. I admit that the summer in Ann Arbor was really nice and I would love to spend another summer here just to enjoy the sun, but that's not the reason why I was here this summer. I chose to stay to do research through SURE (Summer Undergraduate Research in Engineering) program, which in my opinion is one of the most exciting programs for undergraduates. Why? Because not only does it give students thorough information about graduate school, it also helps you hone your logic and analyzation skills by tackling problems that have significant impact to the world!

I applied to the SURE program to work with Prof. Mark Van Oyen, an IOE professor. One of his areas of expertise was healthcare operations and systems engineering. And that was the field I did my research on this summer. I was specifically assigned to work with one of his PhD students, Jonathan Helm, who helped and guided me from the very beginning until the end of the program. And it turned out that doing research is far more exciting than what I thought. Yes, the math was really rigorous. Yes, there are tons of data to be handled. Yes, sometimes you have to present your work to those people that know nothing about your research. And yes, there are tons of things you always still need to know. But it is one of those things that you can get use to with if you put enough time and effort. And it is much more interesting because you can literally work on problems that have been stuck in your mind for years while getting the tutoring from the experts. More than that, you also know that the problem you are working on might revolutionize the world. That's what research really means, right? Doing research is actually trying to make the world a better place to live.

The fun part of doing this research is that, just like working in an internship or any other place, you work for 5-8 hours per day and then you don't have to do anything else afterwards. Did I mention that the summer here is really nice? So you can actually enjoy the weather we're craving for in the winter. I used most of my free time playing soccer, kayaking, canoeing, walking through the Arb, or even just sitting in

parks taking in the sun. The experience I had this summer had simply epitomized the “work hard, play hard” attitude and I would never replace my experience I got through this program with anything else.

IOE 422 - Entrepreneurship Review

By Hitesh Kumar Agarwal

This class exists to help students determine whether the entrepreneurial path is right for them and gives them the confidence to proceed with a real business venture. It is NOT “How to start a business in X easy steps”.

These are the first lines on the course syllabus. This class is unique in its own way. Compared to other senior level technical electives, IOE 422 does not have mind-boggling concepts to understand or hard projects to do. In fact, we do lots of fun stuff in the class such as watching documentaries, movies, and making YouTube videos. There is obviously some serious stuff we do as well such as pitching business plans, interviewing entrepreneurs, attending guest lectures, but these tasks are also very entertaining. This semester our class was focused on water – anything to do with water scarcity, quality, and availability, and anything related to water! Most of the work is done in teams.

Professor Ken Ludwig is an amazing guy and very approachable. He is fun to talk to. His experiences and stories are very interesting. You just can’t stop listening when he is talking. His insights about business, ethics, and risk are very intriguing and very much applicable to real life.

Finally, I think this course is a must-take for all future entrepreneurs. If given a chance, I would love to take this course again, and I am sure I would learn something totally different and new from this semester.

P.S. In this class, our team pitched a business plan and would really appreciate it if you watch it. Go to YouTube, search for “IOE 422”, and watch the video titled “*To: Water – Be Water my Friend*”.

IIE Events – A Great Way to Network with Your Fellow IOEs!

By Valerie Chase

For those of you who didn’t attend the IOE bar night, you missed out! I’d never been to any IOE events until the bar night in October, and let me tell you, I regret not going before. You don’t have to be 21 years old and there’s free food (if you’re an IIE member). What college student doesn’t love that?! Let’s be honest with each other, we all have those people who are in *every single one* of our classes, and you see them every day but you never introduce yourself because random introductions are awkward right? Well, these IOE events put you in a comfortable, relaxed setting where you can bridge the gap of awkwardness and make new friends!

So watch out for upcoming IIE/IOE events and make it a point to attend. There will be a bowling night in the near future as well as a couple more bar nights and the end of the year IOE bar crawl. Come meet your fellow IOEs, make some new friends, get away from studying for a night, and have some fun because these years fly by fast and we need to make the most of them!

Accounting 471 : Better Than Taking Mathematics 300-Level?

By Ronald Wijaya

As IOE undergraduates, we are required to take 6 credits of either IOE or non-IOE technical electives (in addition to the 12 required IOE technical electives). Approved non-IOE classes may include any Math course 300-level or above or Accounting (ACC) 471. You can find the list of the approved non-IOE technical electives on the IOE Undergraduate Student Guide 2008-2009, or you go to:

http://ioe.engin.umich.edu/degrees/ugrad/ugdocs/nonIOE_technical_electives.pdf

I would say that ACC 471 would offer you slightly better benefits than Math classes. For students who do not enjoy or excel in math (like me), ACC 471 is a better alternative. Besides the fact that ACC 471 is relatively easier than math courses, ACC 471 can be double-counted toward your undergraduate and master's degrees if you apply for the SGUS (Sequential Graduate Undergraduate Studies) program. For more details, you can ask Wanda Dobberstein at 1603 IOE.

How to Avoid Getting Sick During the School Year

By Paul Foley

Getting sick is no fun, especially during the school year when you have classes and extracurricular activities. So here are few tips you should follow in order to avoid getting sick:

Sleep – Sleep deprivation has been proven to lower your immune system's effectiveness. It is not only important to sleep the recommended eight hours, but it is also recommended to follow a consistent sleep pattern. Go to bed around the same time each night, and wake up at the same time each morning. Sleeping is important and too little can severely increase your chances of getting sick.

Wash Your Hands – Your Mom always told you to wash your hands before dinner, and she was right. Before eating you should always wash your hands with an anti-bacterial soap for at least 20 seconds. You can use hand sanitizers as well but washing your hands with soap and water is recommended because hand sanitizers can dry out your skin after prolonged use. Bacteria and viruses get into your body through your mouth, nose, ears, and eyes. Therefore it is important to keep your hands away from your face.

Multivitamins – Remember those "Flintstones" vitamins you took when you were a kid? Well they helped give you healthy supplements that you wouldn't get enough of normally. The typical college student diet of pizza and sandwiches and lack of vegetables is not enough to cover the food pyramid. Taking an adult multivitamin can greatly increase your immune system's effectiveness.

Following these three easy steps can greatly improve your chances of not getting sick and will lead to a healthier lifestyle as well.