**PI TAU SIGMA ANNUAL CHAPTER REPORT**
**2011-2012**
**Illinois Alpha**

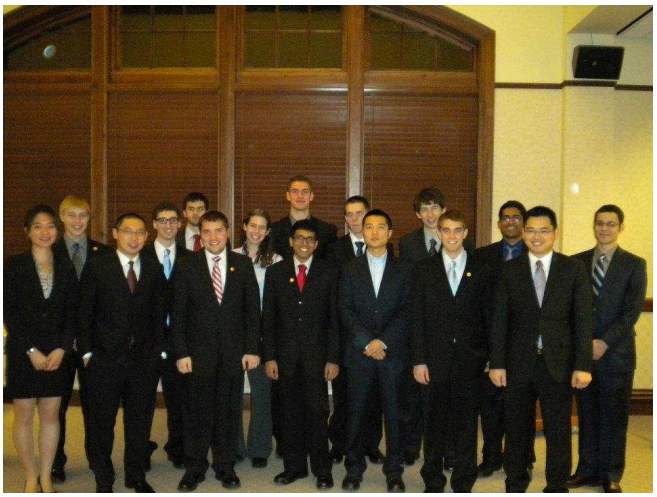
## A. Initiations

### 1. Selection and Recruitment Process

The Illinois Alpha chapter requires its initiates to have completed 60 or more credit hours for a bachelor's degree in Mechanical Engineering, while maintained a GPA of 3.50 or higher on a 4.0 scale. At the beginning of each semester, the Mechanical Engineering department sends the candidates that meet the above requirements an invitation letter by email written by the current president of the society. The invitation explains what Pi Tau Sigma is and some of the events that our chapter has organized and participated in. Additionally, it invites the candidates to an introductory meeting where the initiation process is explained further. Recently, our chapter has begun to initiate graduate students in the department of Mechanical Engineering based upon the recommendations of current members.

### 2. Initiation Requirements

It is important for our chapter to have our initiates get used to participating in the society. We therefore require a high level of involvement for initiation. A points system was created, requiring initiates to achieve a designated level of points to be allowed to initiate. These points can be earned by attending general meetings, participating in social excursions, volunteering at service events, and by involvement in one of our many projects. Although we have a requirement set for each individual category to encourage initiates to be active in all parts of the society, a fair amount of flexibility is allowed as long as the total requirement is met. Graduate students interested in initiating are held to the same requirements; however their research earns them the project involvement points. A lifetime membership fee of $50 is required for all initiates, covering both national expenses as well as expenses for our ceremony. Attendance at the initiate ceremony is required.



Fall 2011 Initiates at Initiation Ceremony

### 3. Initiation Ceremony

Our initiation ceremony is typically held two weeks before the end of the semester. This past year, initiations were held on December 1, 2011 and April 26, 2012 where we initiated 16 and 14 new members respectively. We consider initiation to be a formal affair, and all members and initiates in attendance are required to wear business formal. Initiates are led into a dimly lit room and are told to stand at the front before current members. Executive board members read the initiates the standards and ethics that Pi Tau Sigma works to uphold. Initiates are individually asked if they will uphold these standards when members of Pi Tau Sigma. Initiates are also introduced to the Pi Tau Sigma emblem and coat of arms. Finally initiates names are read and they receive a certificate and are pinned the with Pi Tau Sigma pin. Initiates are also taught the secret handshake and given a PTS Illinois Alpha t-shirt. In the fall, a catered

reception is held for new and old members. In the spring, as a congratulations to the new initiates, as well as a thank you to the graduating seniors, dinner is held at Olive Garden following the ceremony.

**B. Chapter Activities**

1. Fundraising

As always, our chapter placed a heavy emphasis on raising money for charity this year.

*Relay for Life Barbecues on the Engineering Quad*

Each year, our chapter raises money for Relay for Life through the American Cancer Society, supporting both cancer research and care for current patients and families. In what has now become a regular Pi Tau Sigma event, we barbecue on the engineering quad four times a semester in support of this cause. These barbecues are open to the public, and we sell brats, hamburgers, hot dogs, cheese burgers, chips, and drinks for a low cost. Initiates and members staff the grill as well as assist in collecting money and serving customers. Through these barbecues and individual donations we raised over $1500 towards the American Cancer Society. Our Relay for Life team also participated in the event at the University of Illinois on April 14th, where they walked around the outdoor track with thousands of other students in support of finding a cure.

Members barbecuing on the engineering quad

*Engineering Open House Barbecues*

As a new event this year, Pi Tau Sigma expanded our barbecuing efforts past just the eight times during the year where we primarily serve students. We held similar barbecues during Engineering Open House, where tens of thousands of younger students and adults come to the campus. Because of the limited food offerings at the event previously, freshly grilled burgers and hot dogs were a huge success. At the two days alone, we raised well over $700, again support the American Cancer Society. Throughout Saturday, we had a substantial line seemingly the entire day, even having to go out and purchase additional food to satisfy the hungry customers. This is an event we will certainly continue into the future.

2. Service

The primary area of focus this year was to increase the amount of service done in the community. As a side goal, we tried to focus on activities that would help to encourage younger students to pursue careers in engineering and technology.

*Food Drives*

In both the fall and spring semesters, we hosted food drives benefiting the Eastern Illinois Food Bank. The fall drive was centered around the Thanksgiving and holiday time while the spring

semester drive was ongoing throughout the entire semester. During the fall semester, over 90 non-perishable items were brought in to help the less fortunate.

*Robotics Volunteering*

During the course of the year, we made a strong effort to encourage volunteering among the various events held for younger students at the university. Being mechanical engineers, helping out a robotics competitions seemed natural. In the fall, several students volunteered at the LEGO Mindstorms Robotics Competition. They helped as score keepers and time keepers, referees, as well as registration assistants. Similarly, in the spring, students volunteered at the 4-H Illinois State Robotics Competition as judges

Member explaining LEGO Mindstorms to a few eager students

*Children's Science Museum Exhibit Building*

The city of Champaign is blessed to have the Orpheum, a children's science museum. That said, the museum sometimes struggles with their limited staff to put exciting new exhibits together. To continue to help with the spread of engineering towards kids, we helped on a Saturday during the fall semester to help build a haunted house exhibit in honor of Halloween. Over fifteen volunteers from our society came to help the staff. Activities ranged from setting up a mad scientist's laboratory all the way to using foam and spray paint to make stalactites to be hung in the creepy cave.

*High School Science Fair Judging*

On campus, there is University High School, where many local students and well as students of faculty attend. In February, the students were preparing to attend their regional science fair, where they would be required to give a presentation on the topic that they researched and experimented in. In order to help them practice, over twenty of our members and initiates came to their in house science fair night to act as mock judges for their presentations. We gave them feedback on how to improve their presentations as well as posters. Overall, we were all very impressed on the quality of exhibits, ranging from testing trebuchet designs to seeing how chili powder affects the growth of bacteria.

*Technology Club Volunteering*

This year, the Booker T. Washington STEM Academy opened in Champaign, focusing on science, technology, engineering, and math for grade school students. In the spring, they started a technology club, but quickly released that they were going to need help, with over 80 students wanting to participate. Initially, our chapter volunteered merely as helpers, giving a hand to help keep the kids in control and help them with their activities. In the

One of our members teaching a student how to use the hexapod at a technology club meeting

last four weeks however, we expanded our role and actually planned the final sessions. Each consisted of a presentation followed by small group activities illustrating the principle previously discussed. We taught them about the principles of flight, and then had a paper airplane contest. They learned about buoyancy, and then saw how many pennies their paper boats could hold. We lectured them on the uses of robots, and then they got the chance to play with some real life ones. Finally, they learned the principles of structures, and then built skyscrapers out of popsicle sticks. We look forward to continuing our involvement with the club into next year.

3. Departmental Activities

As part of the principles of Pi Tau Sigma, we strive to encourage all students to be active in the department.

*MechSE Forum*

Pi Tau Sigma hosted the fourth annual open forum for the mechanical engineering department at our university. The head of the department, in addition to the undergraduate and graduate heads, facility manager, and multiple support staff we in attendance. This Pi Tau Sigma moderated event allows students within the department to hear the current state of the department, to present their concerns regarding curriculum and student life, and to ask questions about facilities and potential changes in the future. This event has been very well received, and has resulted in changes such as improved lighting in study areas, and better locations for routers in buildings.

*MechSE Volleyball Tournament*

As a means to encourage members of our department to interact on a more informal level, we host an annual sand volleyball tournament in the spring. Students in the department are encouraged to form teams with their friends and research groups. We also encourage faculty to put teams together of themselves and students. This year, eight teams competed for the trophy, eventually won by one of the two Pi Tau Sigma teams in the tournament. In addition to volleyball, drinks, sandwiches, and snacks are served, so those not inclined to play can still hang out.

Teams compete at the fourth annual MechSE Volleyball Tournament

*Student Society Luncheons*

Each month, the president meets with the director of undergraduate programs for mechanical engineering as well as other student society leaders from engineering groups such as ASME and Engineers Without Borders. These luncheons allow an opportunity for new ideas to be brought up to improve the department in

terms of not only coursework, but interacting with companies and external projects as well. It is also an excellent opportunity for societies to work together to assist each other in advertising events and giving a hand when needed.

4. Projects

In order to expand on the knowledge base gained in class, our society finds it important to build both the technical and project management skills that come with working on projects. All of these projects are featured during Engineering Open House at our university. The hard work of all our members resulted in us being recognized for one of the best Engineering Open House performances by the department, as well as an award for best documentation of the event (video can be seen here: http://www.youtube.com/watch?v=coY93kKTRxI&feature=plcp).

*Sandcasting*

A long standing Pi Tau Sigma exhibit, sand casting is always popular among younger students. The concepts of preparing a mold and pouring aluminum are explained, and then everyone has an opportunity to pack their own cope and drag. Our members pour the aluminum and kids are able to take home a souvenir casting. This year, using suggestions from the past, molds were made not only in the shape of cars, but into dinosaurs and U of I medallions as well. This exhibit was recognized by the college, winning first place in the Encore Non-Technical category.

A crowd gathers to pack molds for sandcasting

*Grill Design Project*

This year, our design team worked off of last year's designs to build a functioning grill. Working off the broken department grill from last year, new foldable legs were added to allow for easier transportation. Additional, to facilitate easier barbecuing, a warming station was added, as well as an improved grease catching tray. Finally, the cornerstone of the design was a fan which allowed for the evacuation of smoke from the grill prior to opening, to prevent smoke from hitting the griller's face. The grill was also used to grill during the open house, raising money for Relay for Life. The team's efforts were also recognized by the college, winning third place in the Encore Technical category.

Grill team proudly displaying their award

*Jerry Sanders Robotics Competition*
For the third year, our robotics team built a robot to compete in the Jerry Sanders Design Competition during Engineering Open House. This year's objective placed a heavy emphasis on shooting nerf balls through a hula hoop. Our team designed a flywheel to shoot the balls in addition to an arm to pick them up. They also worked towards improving the chassis. Although our chapter's team did not perform as well as they would have liked, a solid foundation was laid for next year's team to build off of.

*Hexapods*
Hexapods, or six legged robots, are another popular exhibit with children. They are given the opportunity to control the robots, which can walk, sit, and even dance, and navigate them through a course. This year, in addition to the large amount of building and programming required to get the hexapods to work, the team made several improvements to the course. Most notably was the addition of a motorized four bar linkage, to lift the robots to a different level.

Students awaiting their turn to use hexapods

*LEGO Mindstorms Caterpillar Exhibit*
As a new exhibit, our chapter partnered with Caterpillar to create an interactive mine site using LEGO Mindstorms. Our students built excavators and dump trucks which could be controlled using an Android phone. Visitors were then allowed to transfer styrofoam balls around the site, as they would dirt with a mine. This exhibit also was expanded to show the possibilities of LEGO Mindstorms, particularly demonstrating what incoming freshman may do during their Engineering 100 introductory class.

Caterpillar model mine site

5. <u>Social Events</u>
We have always found it important that our members network among themselves. As such, we hold a large variety of social events throughout the semester for our members.

*Happy Hours*
Twice a month, we hold happy hours on the Friday following our general meetings. These are a great opportunity for members and initiates to hang out and wind down from the long work week. We typically have well over thirty members in attendance. They can be seen playing pool, snacking on

Hanging out at a happy hour

the food we purchase, or just hanging out and talking. Being college students, these are some of our most popular events, in addition to the barcrawl that we hold every semester.

*Alumni Events*

We have placed an added emphasis on maintaining communications and relationships with our alumni. Part of this is keeping them updated on the events of our chapter through our newsletter. Additionally, we hold events both on campus and off with them. In the fall, we organized an alumni tailgate around the homecoming football game. We hung out before the game, playing bags, tossing the football around, and grilling, and then attended the game together. The tailgate continued after the game was over. We also went to a White Sox game with some of our alumni in the Chicago area.

Again, we tailgated in the parking lot by U.S. Cellular Field before attending the baseball game together.

Initiates, members, and alumni bonding at a football tailgate

*ASME Rivalry Events*

Recently, a friendly rivalry between Pi Tau Sigma and the American Society of Mechanical Engineers has been building. This helps to build camaraderie among not just our members, but students in the department as a whole.

In the fall, the two societies went paintballing with each other. In the spring, we played ASME in softball a couple of different weekends. It is important to note that Pi Tau Sigma has yet to lose to ASME in softball.

Bowling at the union after a meeting

*Other Excursions*

In addition to the above events, our chapter holds several other social events throughout the year. After a meeting in the spring, we went bowling at our school's union. Great participation was seen by initiates and members alike. We also went to a couple hockey games in the fall. These worked out nicely as a group would head over to the ice arena directly following a happy hour. Other activities included a laser tag outing and a watching the Illini baseball team play. In the fall, we had a tie-dying event early in the semester, where initiates were able to meet and get advice from the older members. We also field a team during Engineer's Week, where societies compete in activities like marshmallow toss and football throwing contests.

Members enjoying themselves at an Illini hockey game

6. <u>Chapter Business</u>

*General Meetings*

During the semester, we had general meetings every other week. These meetings gave us an opportunity to meet as a society to cover upcoming events, listen to speakers, and socialize among ourselves. We require initiates to attend at least 5 of the 6 meetings during the semester, though class conflicts are taken into account as well. A primary focus of these meetings is the speakers we bring in from various areas, such as academia and industry. This allows for our members to be up to date on current happens in the job world, as well as to be exposed to what research is being done in our field and the opportunities that exist there. From the corporate world, we had speakers from Intel come and talk to us. They discussed career opportunities within their company as well as some new discoveries they were making in the manufacturing of semi conductors. We also had Dr. Bryan Wilcox, a former graduate from our department, come and talk to us. He has started three separate companies, and was able to

Members and initiates socializing before a general meeting

educate us on becoming an entrepreneur. Finally, the graduate head of our department, Professor Harley Johnson, come speak to us on the topic of the National Science Foundation. He spoke to us about the application process as well as discussed opportunities to get involved in research at the university early on in our studies. In addition to external speakers, we do a couple of events at general meetings every year among ourselves. We always start the year with an ice breaking meeting where the initiates and members can get to know each other. In the fall we usually barbecue after a brief meeting, while in the spring we go out to a local restaurant. Additionally, one meeting every semester is dedicated to giving course advice. This provides a great opportunity for the old members to share their experiences as to how to best create your schedule. It is also an opportunity for undergraduate students to learn more about grad school from our graduate members as well as what it takes to get there. By having such a well rounded base of meetings, our members pursue opportunities after graduation that range from grad school, to national laboratories, to Fortune 500 companies.

*National Convention*

Despite the convention being in California this year, we felt it was important to send a large, young group of members to nationals this year as we will be hosting them in only a few years. As such, we sent a group of four members out to San Jose State University in early March. The group enjoyed their trip and came back with a lot of great ideas on how to improve our chapter as well as on what we need to do to make nationals a success in 2015.

*Scholarships*

Our chapter believes that scholarships are a great way to reward members who put a lot of time and effort into our society. These scholarships are voted on by the executive board of the chapter (who then is ineligible to win the awards). Each spring, at the initiation ceremony, we award five different scholarships. The first is the James W. Bayne External Service Award, named after the former professor at our university as well as one time national president of Pi Tau Sigma. It goes to the member who shows the most enthusiasm and dedication towards service

Members and initiates at the department awards banquet

projects as well as fundraising. Another scholarship we award is the Most Valuable Member Award. This award goes to a member who really exemplifies the society, by showing up at events, planning new activities, and just lending a hand wherever needed. The Unsung Hero Award is given to a member who puts in a lot of work to make the society better, but perhaps does not seek a large amount of recognition for his or her efforts. Finally, to reward initiates who go above and beyond the minimum point requirement, we give an Initiate Award for both the fall and spring semesters. In addition to these scholarships, two departmental awards are given to members of Pi Tau Sigma. These are the Pi Tau Sigma Sophomore award, given to the most outstanding sophomore, and the James W. Bayne Award, given to the most outstanding senior in our society. Along with the past year's initiates, these two award winners are recognized at the annual department awards banquet in the spring.

*Society Organization*

The executive board of our society is comprised of a president, vice president, treasurer, recording secretary, corresponding secretary, webmaster, and historian. They meet on a weekly basis to ensure that all events are ready and to make sure necessary actions are being performed. The president also meets on a weekly basis with our chapter advisor to ensure that everything is running smoothly. The vice president is in charge of meeting with all of our chairs: social, service, fundraising, projects, and nationals. Each of these chairs also has a committee to help them prepare for and run events. The treasurer is responsible for creating the year's budget as well as preparing reimbursements for members. The recording secretary is responsible for tracking attendance and points of members of initiates, as well as sending weekly emails to our society. The corresponding secretary serves as our external contact, attending Engineering Council meetings as well as arranging for speakers to come to our general meetings. The webmaster maintains our website as well as creates necessary sign up forms. Our historian documents our events in pictures, keeps our display case current, and keeps contact with alumni. All of our positions are voted on at elections in the spring. Candidates give a speech on why they think they are qualified as well as their ideas on what to do next year. An anonymous vote is then held with all running candidates out of the room. Elections are done from president downwards so that losing candidates have an opportunity to run for other positions as well.

2011-2012 executive board

**C. Other**

1. Website

Please visit our website for additional information.
http://pitausigma.mechse.illinois.edu/