# PI TAU SIGMA ANNUAL CHAPTER REPORT
# 2014-2015
# Illinois Alpha

## I. Initiation

### 1.1 Selection and Recruitment Process

The Illinois Alpha Chapter requires candidates to have obtained a minimum of 60 credit hours towards their Mechanical Engineering degree, typically a junior standing, while simultaneously maintaining a minimum 3.5 GPA on a 4.0 scale. The Mechanical Science and Engineering Department (MechSE) sends an invitation, written by the chapter president, at the beginning of each semester to those candidates that meet the above requirements. The invitation is to an introductory meeting where the society leaders – the executive board, chairs, and project leaders, introduce themselves and what the society does. Additionally, the requirements for initiation are introduced. At the beginning of the year, the executive board placed a bigger emphasis on recruitment than in years past. In order to accomplish this, a peer mentorship program was established, where each new member was assigned an active member as a mentor. This ensured that every new member had been introduced to at least one active member and had a contact to help assimilate them and show them how to get involved with the society.

### 1.2 Initiation Requirements

Our chapter believes that it is in our initiates' best interests to become actively involved in society events. As a result of this belief, we require a high level of participation throughout the initiation semester in order for candidates to be initiated into a member of the society. Our chapter identified a need to improve our orientation process in order to establish better communication and interaction between both our initiates and the society, and within the initiate class. Therefore, a substantial component of our initiation requirements going forward will involve a set of "initiate-only" events designed to instruct these new members on the workings of PTS and foster relationships amongst the new initiates. The aim is to structure the initiation requirements so that initiates form a stronger connection with the society during their first semester, and our first semester for implementing this new set of requirements will be Fall 2015.

### 1.3 Initiation Ceremony

Attendance at the initiation ceremony is required. The ceremony is typically hosted during the last two weeks of each semester before finals. This year's ceremonies were hosted on December 9, 2014 and May 5, 2015. 31 new members were inducted into the society in the fall, which is by far the largest class we have

had in the past 20 years. 10 new members were inducted into the society in the spring. In addition, we had the exciting opportunity to initiate 4 new members during the national convention we hosted this February. Our initiation is a formal affair. Business professional attires are required for all the participants. During the ceremony, initiates are led into a dimly lit room and are instructed to stand at the front of the room. The executive board then get turn introducing to the initiates the code of ethics that Pi Tau Sigma strives to uphold, asking for individual pledges from initiates that they will also work to uphold them. The Pi Tau Sigma coat of arms and emblem are then introduced, with the rationale behind each being given. At the end, initiate's names are read, they are taught the Pi Tau Sigma handshake, and are given a Pi Tau Sigma pin, pencil, and t-shirt. This year, as always, we took the initiates out to Olive Garden for formal dinners after both ceremonies.

## II. Chapter Activities

### 2.1 Fundraising

Raising money for charity has been part of the tradition of out chapter. This year, we allowed our fundraising committee to decide on which non-profit organization they wanted to benefit. We decided on donating to the Wounded Warrior project, which provides resources and care for injured veterans. As usual, we barbecue on the engineering quad four times during a 2-week span during the semester. In these barbecues, we sell bratwursts, hamburgers, hot dogs, cheeseburgers, chips, and drinks at a low cost. Grilled cheese was introduced as a new option for vegetarians. 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 $1,200 towards the wounded warrior project.

### 2.2 Service

#### *Booker T. Washington Technology & Engineering Club*

This year marked another successful year of the afterschool engineering club at the local STEM academy. After the success from last year, we were invited by the BTW academy to run their afterschool engineering club again this year. The program was so popular that there were more people signed up than what we could offer. As a result, the afterschool program was broken into two programs this year – one for k- 2$^{nd}$ graders and the other for 3$^{rd}$ – 5$^{th}$graders. PTS was asked to take charge of the K-2$^{nd}$ program first semester, and the 3$^{rd}$ – 5$^{th}$ graders in the spring. It was a very valuable experience for our members to work with both age groups and see the energy and excitement that they have for the topics presented. Over the course of the year, more than 50 grade students participated in the club.

The structure of the club this year consisted of two separate, eight-week sessions, one for each in both fall and spring. In cooperation with the STEM advisor at BTW academy as well as Joe Muskin in the MechSE department, we developed a curriculum that contains plenty of hands-on activities, in order to explain concepts discussed. Throughout each session, emphasis was placed upon design and iteration of proven examples. The topics covered included conductivity, jet power, chemistry, sound energy, structures, earthquakes, magnetism, wind power and motors. Each of these topics was introduced with a short, 10 -15 minute presentation of the basics of the topic, and then a 30 - 40 minute, hands-on activity. PTS has received a few service awards from our department due to our involvement with the engineering club. A few reports can be found on the department newsletter regarding our events. We will continue our involvement with Booker T. Washington into the future, and are excited to be a part of such a valuable initiative.

### *Family Engineering Night*

Family Engineering Night was like an extended version of afterschool engineering club. The interest in these Family Engineering Nights arose because of the success of the afterschool engineering club, and our volunteers were asked to “spread the love” to other school programs in the area. It took place once every semester. Over 100 students and their parents participated in 8 activities hosted by Pi Tau Sigma. Families were broken down into groups and they could pick which activities to participate. Each of the activities would take about 25 minutes. The engineering night would last for 2 hours. Most families could participate in at least 4 activities. The Engineering Family Night that we hosted in the fall semester was extremely successful. Both students and parents loved it. As a result, Booker T Washington Academy had us back for another one in the spring semester. In addition, it was so popular that two more elementary schools in the region asked if PTS could reach out and host one for their students.

## 2.3 Departmental Involvement

As the honor society within the MechSE Department, we believe that it’s important to participate in new initiatives and help to provide feedback to the Department on new initiatives or events. In addition, we have made efforts in the past year to connect our students with faculty through undergraduate research assistanceships.

### *MechSE Forum*

The Forum is in its 7$^{th}$ year. It is an annual event, hosted by Pi Tau Sigma, which brings together undergraduate and graduate students, and the Department

administrators, as well as several members of the Faculty. In attendance this year were the Department Head, undergraduate head, graduate head and a member of the faculty. The purpose of the Forum is to allow for an open discussion of curriculum, facilities, and the general state of the Department. The event has become very popular in recent years, and this year over 50 students were in attendance. An initiative that was first brought up through this forum, and still continues to be brought up, is the implementation of more tangible "project" based design courses. Specifically, in the mechanical design I/II courses and Design for Manufacturability, a significant project portion was introduced and has been grown over the past two years. With the addition of a student projects lab, followed by a full-blown innovation studio, our department has worked with students to enact programs to fit their desires.

### *Student Society Luncheons/Undergraduate Advisory Board*

Each month of the year, the president or the vice president meets with the director of undergraduate programs, department staff, and leaders from other student societies such as ASME and SAE. These luncheons are a place where more continuous feedback throughout the year can be asked for and acted upon by the Department. It also serves as a platform for student societies to inform the Department of significant events going on with their students, as well as enlist the support of other societies in hosting events, advertising, and general planning. This year, the luncheons were actually run by an Undergraduate Advisory Board which was formed as a liason between students and the department. This luncheon meeting was a helpful place for Pi Tau Sigma to discuss its membership initiatives and generate new ideas for future progress.

## 2.4 Projects

We believe that hands-on projects can teach us how to deal with real life engineering problems, and so each year our chapter invests in projects that we believe teach valuable lessons, with the added bonus that during our annual Engineering Open House (EOH), we are able to promote interest in Mechanical Engineering to young students.

### *Sandcasting*

One of our longest-standing projects, sandcasting is a primarily EOH-focused exhibit, and is very popular at that event. This year it was also featured in the fall MechSE Open House for prospective freshmen as well as the summer girl engineering camp. Our students will explain each step of the process – from packing the mold, cutting the sprue, melting and pouring the aluminum, all the way to separating the mold and quenching the cast part. Visitors can even get

their hands dirty in the sand and make their own mold and part, and they get to take home a souvenir part. The collection of molds our group makes continues to grow as time passes – this year, a Batman mold was added!

### *Design Project*

Every year, we start a new idea for our design project team and they will design and build it. This year's project was easily the most technically challenging and coolest project that PTS has taken on in recent years. Pi Tau Sigma set out to design a fully-functional hover car! Throughout the year, a group of 8-9 students was able to design a cart that both achieves levitation and thrust, and the exhibit was featured during EOH in the spring.

### *Jerry Sanders Robotics Competition*

Now in its sixth year, our robotics team built a robot to compete in the Jerry Sanders competition during Engineering Open House. This year's objective was to manipulate plastic balls and place them into goals or "end-zones" to score points. In a king-of-the-hill environment, several portions of the course were contact zones, which made for interesting viewing. Our team did fairly well, advancing to the quarterfinal round of competition. This year's team also obtained materials to significantly improve the frame and drive train for next year's robot.

### *LEGO Mindstorm*

This year marked the second year that we started running LEGO Mindstorm during the Engineering Open House. We assembled small lego robots following instruction and controlled them through smart phone applications. We had a stage set up for the EOH exhibition. Kids were able to engage in fun games with the LEGO Mindstorm robots, and our team had a great time designing the challenges in order for them to play.

## 2.5 Social Events

Our chapter has always found it valuable for members to develop significant relationships with each other outside of the classroom. To fulfill this, we organize many social events throughout the year.

### *Happy Hours*

We have happy hours the Friday following our general meetings. This semester, we had nine happy hours. These events are great opportunities for members to interact in a very laidback environment and to wind down at the end of a week. We regularly record over 20 people in attendance, and snacks are provided for all. These are our most popular social events, other than our bar crawl that occurs each semester.

### *Initiate-Only Dinner*

As an attempt to establish a more intentional relationship with our new members, the executive board treats the new initiate class to dinner the week after their invitation to the society. Here, initiates are able to meet each other and the leaders of the society in a relaxed and comfortable setting, where they can ask more provocative questions about the society and start to get a feel for where they will fit in and get more involved. This has greatly improved our retention rates, as initiates feel much more welcomed and encouraged to participate with events such as this. Going forward, much of PTS's initiation requirements going forward will be based on similar "initiate-only" events with the same goal of keeping a close relationship with the group of initiates.

### *Pickup Basketball Games*

A lot of PTS members are sports fans, and some of them enjoy playing sport. With a strong request to organize basketball pickup games, we started to play basketball on Saturday mornings. The turn out were pretty good in a few games, one of which we had more than ten members showed. For the next semester, we were planning to have monthly sport event such as pick up basketball, volleyball and soccer games.

### *Barcrawl*

Every semester, Pi Tau Sigma members organize a barcrawl to celebrate a successful semester and spend a night out in Champaign together. The consistently high attendance of our barcrawls is a testament to the friendships that our members form with each other throughout their time in the society.

## III. OTHER

A. General Meetings

During the semester, we typically hold a general meeting every other week. These meetings ensure that as a society everyone is aware of upcoming events and service, as well as give students the opportunity to hear from different speakers about opportunities that exist for Mechanical Engineers in industry or in academic research. Initiates are required to attend a minimum of four meetings, with class and/or exam conflicts being accounted for. This year we focused on bringing in corporate speakers that would speak about things other than their company, such as career development, networking, strategy, or life of a career engineer. The engineering career services also gave us a workshop before the engineering career fair at the beginning of the school year, helping us editing our resumes, practicing our 30-second pitch, as well as discussing common problems. One of the more exciting things that happened with these meetings is that when IMI Cornelius came to speak, one of our alumni came with, David Joyce, and was able to speak about the beverage dispensing industry again. They have hired so many PTS interns since they started a internship program last year. Up to date, more than 5 members from our chapter have interned in the program.

B. National Convention

This past year was a fantastic opportunity for the Illinois Alpha Chapter to host the 100$^{th}$ Anniversary National Convention. Throughout the past 2 and a half years, the Alpha chapter has spent countless time planning and preparing for this event, and even created a brand new executive board position to dedicate an extra person to the planning responsibilities of the event. We were so grateful for the opportunity to host the convention, and we were extremely satisfied with the turnout and success of the events. With over 240 members in attendance, despite some “harsh” Illinois weather, our members were able to hear keynote speeches from phenomenal speakers such as Dr. William King. This year, our chapter also worked hard to develop a meaningful chapter programing workshop designed to spread ideas amongst Pi Tau Sigma chapters and initiate change within chapters based on the way other chapters function. The Illinois Alpha Chapter was no exception to this goal, and several of the initiatives that were developed going forward were first discussed seriously after our workshop on Friday morning at the convention.

Additionally, Illinois was able to help our society celebrate 100 years of the existence of Pi Tau Sigma. Our initiation ceremony on Saturday was an exciting

way to celebrate our history, and 11 new members from 4 different chapters were initiated – 2 of those chapters were the founding chapters, and 2 were our brand new chapters.

C. Scholarships

Scholarships are a fantastic way to encourage the involvement of active members in the organization and award their dedication. Our chapter gives in excess of $1500 in scholarships annually, as we believe it an important part of maintaining a high level of involvement. For each of these awards, nominations are received during the general meeting and the executive board then votes to determine the winners. At initiation ceremony at the end of each academic year, we announce five different awards. The first is Most Valuable Member, the award given to the person who has contributed the most to the society throughout the year. The second award is the James W. Bayne External Service Award, named for a former professor at UIUC who also served as the national president of Pi Tau Sigma at one time. The recipient is a member who shows great enthusiasm and dedication towards the service activities of the chapter. This year, this award goes to Julia who has made extraordinary efforts to promote and improve the after school engineering club at the BTW, with the help of Joe. The Unsung hero award is typically given to a member who holds no leadership position at all in the society and gets no credit for their efforts, but who still works diligently to attend events, help in planning, and generally is an outstanding contributor to the society. Finally, the last two awards are given as Outstanding Initiate Awards, one for each semester. The recipients are selected according to the points that they've gained through out the semester.

Two Pi Tau Sigma awards also exist at the Department level: the Pi Tau Sigma Sophomore Award, for an outstanding sophomore in Pi Tau Sigma, and the James W. Bayne Senior Award, for an outstanding senior in Pi Tau Sigma. These award winners are recognized at the spring awards banquet, along with the past year's initiating members.

D. Society Organization

Our chapter is governed by an executive board, comprised of a president, an external vice president, an internal vice president, a treasurer, a secretary and a national convention chair. The board meets on a weekly basis to ensure that everything is running smoothly with the organization at a high level. The president meets bi-weekly with the chapter advisor so that they are aware of upcoming events and are informed of any problems with the chapter's operation. Our vice president typically holds a chair meeting once a week, where the social, service, fundraising, nationals, and projects chairs are all in attendance. These

chairs run committees of active members to plan and execute events. Our treasurer ensures that our budget is up-to-date and that the university is processing reimbursements. The external vice president serves as an external contact, setting up speakers and attending our Engineering Council meetings. The secretary is responsible for the weekly email that we send, as well as recording attendance for the events that we host throughout the semester.

As an initiative to increase the connection we build between initiates and the leadership of the society, our executive board added a new position for the 2015-2016 calendar year, called the Vice President of New Members. The goal of this new officer is to develop an orientation program for initiates centered around giving initiates a better context for what Pi Tau Sigma actually is, how initiates can get involved, and what benefits they stand to gain from joining. The goal is that in years ahead, initiates form a tighter bond with the other initiates that join the same semester, leading to a greater sentiment of shared experiences throughout our membership. These connections will help to keep our members involved in the society well beyond the time that they initiate.

For other questions, please visit our website, at www.pitausigma.mechse.illinois.edu, or email us at ptsillinoisalpha@gmail.com.