Pi Tau Sigma Annual Chapter Report

2016-2017

Florida Sigma Omicron

A. Initiations

The selection process begins weeks before classes start, as the secretary works towards acquiring the list of eligible students who qualify to be inducted into Pi Tau Sigma. Eligible students receive an email during the first week of classes congratulating them on their accomplishments and inviting them to an information session where they may learn more about the Florida Sigma Omicron chapter of Pi Tau Sigma. The email expounds on the opportunities Pi Tau Sigma provides to students, both professionally and socially, and highlights the reasons students should take up the opportunity to learn more about the chapter. Two information sessions are hosted during the second week of classes in which the chapter provides food and refreshments to those who attend. During the meeting, the officers, headed by the president and vice-president, present to the potential initiates. The presentation includes a brief history of Pi Tau Sigma, an explanation of the core values of our chapter, a run through of outreach events and service events done on campus in the past year, and a detailed explanation of the initiation process and the requirements for initiation. The students who attend the information sessions are grouped into a Listserv and the secretary provides a schedule of the events planned for the semester with dates and times. Periodic emails are sent throughout the semester to provide more information on upcoming events, and to announce any new additions late in the semester.

The chapter hosts a variety of events throughout the semester, and initiates must attend one social event, one service event, one lab tour or company tour, and a mandatory polo sale and kickball game, to be eligible for initiation. These events are planned to provide a strong opportunity for each initiate to socialize with their fellow students outside of the university campus in a fun and friendly environment, give back to the local community and teach engineering to young students, explore the university laboratories and local engineering companies, and network with students and professionals in order to help each other succeed. Dues of the amount of $50 are due at the last event before initiation, which is the required kickball game. Initiates receive a t-shirt, bent, membership card, and certificate for their dues. Initiates are encouraged to polish their bents in unique ways, and a competition is held during initiation in which the smoothest and shiniest bent wins a prize. Any member that does not meet the requirements is not initiated and is told to try again next semester, assuming that the person in question is still eligible. Any initiate who misses one mandatory event that takes place only once a semester, such as the kickball game, due to a university sanctioned event, or other subsequent reason deemed appropriate, can make up the event with a five to ten minute presentation to the officer board on an engineering topic of that person’s choice, that must be approved by the president beforehand.

Finally, the last requirement in the initiation process is to attend initiation. The initiation ceremony follows tradition. After the class of initiates get professional head shots taken in their business formal attire, the group is then escorted by an officer into a dark conference room, where two candles are placed at the head of the conference room table, illuminating picture frames of the Pi Tau Sigma coat of arms and Pi Tau Sigma emblem, along with a stole, a chord, and a bent. The president and vice-president stand at the head of the table, while the initiates are seated at the table, and other officers and active members stand around the initiates. The president and vice-president then follow the initiation handbook with which they lead the initiates into pledging to uphold the ASME Code of Ethics and the ideals of the engineering profession, as fostered by Pi Tau Sigma. The vice-president then passes along the traditions of the Pi Tau Sigma coat of arms and emblem, describing the significance of each of their designs. Each initiate is taught the official Pi Tau Sigma handshake, and is then congratulated by each officer as handshakes are exchanged. To finish the proceedings, each initiate dates, prints, and signs their name onto the new initiation roll book.

After the ceremony, a celebratory dinner is held in the same conference room. During the dinner, officer elections take place for any new or open positions for the next semester. This process is led by the president, and any member running for an officer position is to give a speech about their goals for the position and what they would bring to the officer board and chapter. A vote takes place for each position, and new officers are named accordingly.

The Fall 2016 initiation took place on Friday, December 9th, in which 14 members were initiated into the Florida Sigma Omicron Chapter of Pi Tau Sigma. There was also one Honorary Initiate this semester, which was the new Faculty Advisor, Dr. Hitomi Greenslet, who has been an amazing addition to the chapter.

The Spring 2017 initiation took place on Thursday, April 20th, in which 11 members were initiated.

Figure 1. Initiates from the Fall 2016
Initiation Ceremony

B. Chapter Activities

Introduction to Engineering: In an effort to spread knowledge of mechanical engineering, recruit more engineers, and become a larger presence on campus, the Florida Sigma Omicron chapter began volunteering to teach Introduction to Engineering in 2015. In this class, we teach students about what mechanical engineering is, show them some examples of engineering, talk about student involvement, and tour our student labs. Some of the examples include: folding a carbon fiber wing, a gas combustion cylinder, 3D printed objects, and a replica of Theo Jansen's Strandbeest. We present Pi Tau Sigma and what we are as well as other organizations and design teams on campus to encourage student involvement. After the presentation, we build composite beams to use in a Charpy impact test and tour the design and manufacturing lab to show students what they can expect to do as a student and beyond. The students design and build a beam that is tested to measure the amount of energy absorbed per unit of mass. This allows students to have a fun and exciting hands on activity while applying mechanical engineering principles. In the design and manufacturing lab we get to show them lots of unique ways to manufacture and discuss the importance of designing for manufacturability.

Figure 2. Students view and play with a gas combustion cylinder in the design and manufacturing lab tour

Figure 3. Students watch the Charpy Impact hammer destroy the beam in slow motion on the computer afterwards.

MAE Undergraduate Research Symposium: The MAE Undergraduate Research Symposium is the College of Mechanical and Aerospace Engineering's annual research project presentation in which undergraduates can share their research with faculty, fellow students, student organizations, and notable members of the External Advisory Board. This event is hosted by Pi Tau Sigma, and is planned in conjuncture with the annual Awards Banquet. This year, the department wanted to improve the student turnout from previous years and have as many students and student organizations present as possible. The chapter responded to the department's request and the presenter participation totaled 15 presenters, 6 presenting individual projects, 6 representing the Society of Women Engineers (SWE), and 3 representing Design, Build, Fly.

Invitations and flyers for the symposium were posted to MAE social media sites, as well as around the various MAE buildings on campus. All interested undergraduates received a PowerPoint poster template where they would describe their research topic by giving the background, problem statement, and current and future work of the project. Once all the posters were completed and returned, the officers printed and laminated the posters for the students.

Figure 4. A birds-eye view of the judges listening to the presenters at the Undergraduate Research Symposium

The Symposium was held on campus, in the New Engineering Building (NEB) rotunda on April 13th, 2017. A panel of four judges consisting of two UF MAE professors, a retired Major General, and a Ph.D researcher at Eglin Air Force Base. These judges listened to each presenter and reviewed their work on provided judge scoring sheets. After a brief deliberation, three winners were selected and awarded with an invitation to the MAE Awards Banquet, as well as cash prizes directly from the department: $250 for first place, $150 for second place, and $100 for third place. The event was praised by all faculty, EAB members, and students in attendance. Next year, promotion for this event should be the top priority to raise participation even higher.

***Social Events*:** The Florida Sigma Omicron chapter maintains a robust calendar of social activities intended to provide a stress-free atmosphere in which members, officers, and initiates network and interact with one another. Socials often are held in conjunction with other student organizations in the Mechanical and Aerospace Engineering department, to foster lasting relations with those groups and promote the Pi Tau Sigma name. Our socials are always well attended by both initiates and current members.

This fall, Florida Sigma Omicron hosted a social at Mochi, a local frozen yogurt establishment, which 22 students attended. As well, at least once each term we attend trivia night at Gators Dockside, where we eat, socialize, and test our knowledge of non-engineering topics. In the fall, we had 25 attendees and in spring there were 13.

During the fall, our president hosted an away game tailgate for the UF—LSU football game, which 12 students attended. Throughout the year there are various impromptu potlucks centered around holidays, sporting events, and the like. In the spring, 20 Florida Sigma Omicron members, officers, and initiates came out to a social on our Reitz North Lawn to eat Publix subs (a local favorite) and play sports. In conjunction with ASME this spring, 2 of our members played laser tag at a local course. When the weather warmed up, 7 members spent a day at Lake Wauberg, a recreational area owned by the university that is free to students. We swam, played sports, slack-lined, and ate together afterwards.

Later in the spring, 12 of us went to TGI Fridays for their Endless Apps special and reminisced about the memories and successes of the past year. Our final social of each semester is a PTS kickball game a few days prior to initiation, in which the officers are pitted against the initiates.

Figure 5. The members and initiates at the TGI Friday's social

Figure 6. Slacklining during the Lake Wauberg Social

Service Events

Art in Engineering: Every year, the University of Florida hosts an annual Art in Engineering event, where the goal is to showcase projects that students work on that involves any variation of engineering practices, but that can also be interpreted as a piece of art. This year, our chapter of Pi Tau Sigma assisted the Gainesville Area Chamber of Commerce in hosting a group of local companies who were there to display their products and discuss the applications of them. The companies in attendance were: Duke Energy, Theme Works, Fracture and Goodwin Heartpine. The 10 members and initiates of Pi Tau Sigma who attended the event worked with the companies and the chamber of commerce to inform people about the products the companies displayed, along with facilitating a raffle. This event gave our members the opportunity to network with these companies, learn about their products and about the implementations of engineering. It also allowed PTS to give back to the Gainesville community by assisting the chamber of commerce in the hosting of these companies.

Fall GatorTRAX: On Saturday, October 22, 2016, Pi Tau Sigma cohosted a GatorTRAX session with Tau Beta Pi. GatorTRAX sessions involve engineering students hosting both lessons and hands-on activities to teach elementary-aged children basic concepts of different fields of engineering. This session provided an overview of Mechanical Engineering, with brief descriptions of basic physics and dynamics. The lecture portion involved both a PowerPoint detailing basic principles of Mechanical Engineering as well as a hand-out for the children to complete. After the lesson, the children were divided into groups in which they had to design a "rollercoaster" made from foam piping and marbles. They competed against the other groups with their scores being based on both the height of

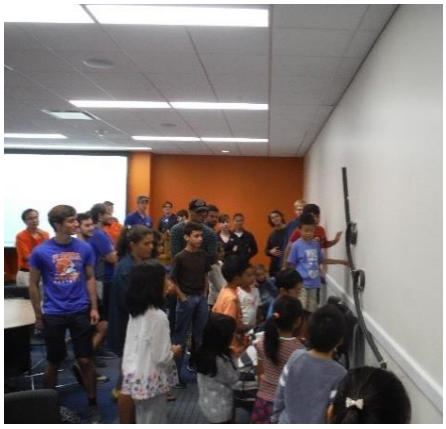

Figure 7: Measuring the heights of foam insulation roller coasters during the Fall GatorTRAX.

the rollercoaster as well as the number of loops involved in it. They also had to ensure that the marble did not lose contact with the rollercoaster track. The officers of Pi Tau Sigma lead the lecture and described/scored the hands-on competition. The members of Pi Tau Sigma assisted the children both during the lecture and in their building of the rollercoaster, when needed.

Spring GatorTRAX: On Saturday, February 18, 2017, Pi Tau Sigma cohosted another GatorTRAX session with Tau Beta Pi. This session delved into the topic of stability and the basic ideas of physics that relate to it. After the short lecture on Mechanical Engineering and stability, the children were divided into groups to compete to see who could build the tallest tower made from dry pasta that could support a marshmallow. Each team was allotted twenty sticks of pasta, a foot of tape, and a foot of string. The scores were based on the final height of the marshmallow from the table after it was placed on the tower without the tower collapsing. The officers of Pi Tau Sigma were in charge of both leading the lecture portion as well as describing and overseeing the hands-on competition. The other members assisted in keeping the students focused during the lecture and on-task during the competition. The Pi Tau Sigma members were also in charge of tasks such as cutting the string and tape, as well as placing the marshmallow on the tower, to ensure safety.

Figure 8: Lecturing on the importance of stability during the Spring GatorTRAX.

Mechanical Engineering Student Rooms Cleanup: On Thursday, March 30, 2017, Pi Tau Sigma held an event to clean two of the rooms in the Nuclear Science Building, the MAE Student Lounge and the MAE Student Society Conference Room. Many of the members of Pi Tau Sigma, along with other Mechanical Engineering students, use the MAE Student Lounge for studying and the officers of Pi Tau Sigma often use the MAE Conference Room to hold meetings. To improve organization and cleanliness of the rooms, a group of Pi Tau Sigma members met up to sanitize the rooms and remove any trash or otherwise unused items from the rooms. Throughout the clean-up, the members moved the furniture to scrub down all of the walls, tables, and windows using cleaning products and then also vacuum the floors. Any trash or junk that had been left in the rooms was then disposed of to allow the rooms to have more space, and therefore be more usable for studying and meetings.

Engineering Fair: Every year, the Benton Engineering Council hosts the Engineering Fair which is an event designed for introducing elementary, middle, and high school students to STEM related fields by having different University of Florida engineering student groups present several types of projects, and the Florida Sigma Omicron chapter of PTS participated by bringing a pneumatically driven golfing robot. This robot was designed and manufactured by a former Ph.D student who worked for our faculty advisor. It gave the members of Pi Tau Sigma the opportunity to practice their public speaking skills while discussing the principles applied in the design, and it also drew a lot of interest from the visiting students, since they were actually able to control the valve that actuated the robot that struck a golf ball on a string. The hands-on, high velocity demonstration generated a lot of interest during the event.

Figure 9: Demonstrating the mechanics of a golf swing and how it relates to the pneumatic golfing robot during this year's Engineering Fair

Lab tours: To promote research and graduate school we also host lab tours twice a semester to expose our initiates and members to research opportunities. In the fall we toured Dr. Peter Ifju's Micro Air Vehicle Lab and Dr. Hitomi Greenslet's Nontraditional Manufacturing Lab. In Dr. Ifju's lab students learned about airplanes and the challenges of making airplanes smaller and smaller as well as what materials are used in manufacturing small airplanes. In Dr. Greenslet's lab students learned about how to polish to extremely fine nano-surface finishes, what industries are looking for better polishing methods, and what goes into maintaining a clean environment for nano-surface finishes.

Figure 10: Dr. Ifju discussing the manufacturing process of MAV's during a lab tour.

In the spring we toured Dr. Greenslet's lab again as well as Dr. Ghatu Subhash's Center for Dynamic Response of Advanced Ceramics. In Dr. Subhash's lab students learned about how ceramics behave differently than other materials and that under extremely high strain rates the mechanical properties are different. Students also got to see a Split Hopkinson Pressure Bar Test performed.

Through lab tours students interacted directly with graduate students and research professors. A couple of members have joined Dr. Greenslet's lab since touring so the initiative is successful in recruiting researchers and teaching students about research topics at UF.

Manufacturing Day: This year, the Florida Sigma Omicron Chapter of Pi Tau Sigma became an Associate Member of the of the Chamber's Advanced Manufacturing Council, which includes STEM companies from the Gainesville area. We are currently the only student group that is a member of this organization. Becoming a member of the council opens the door for PTS to schedule company tours and other networking opportunities with companies in the area, providing our members with exposure to industrial settings.

Figure 11: A screenshot of the CAMC's webpage, where PTS is shown to be an Associate Member

One opportunity the council provided us with, was to be involved in a group of company tours being held in conjunction with local high schools on Manufacturing Day. Four high schools from the area each toured two different companies, and Pi Tau Sigma had a total of eight members, two per high school, attend the tours. We acted as a point of reference to the high school students for information on colleges, and we also were able to tour incredibly interesting companies in the area. Going forward, this is an event that PTS hopes to partake in annually. This event served as floating requirement credit for our initiates, and could count for either a Lab Tour/Company Tour credit, or for a Service Event Credit.

Company Tours: As of this year, our chapter decided to begin offering company tours for our members, exposing them to industrial environments. In years past, we have only offered tours of our department's research labs, which we felt only catered to the students interested in pursuing graduate school, or REU's. Our goal was to also provide events that engaged students pursuing internships or full-time jobs as well, so by offering both company tours and lab tours, we could cover both of the main future paths for a mechanical engineering student. This year, we scheduled tours with both Fracture, a company that laser prints custom photos on panes of glass, and Exactech, one of the world's largest medical implant manufacturers. We had 11 members tour Exactech, and 6 tour Fracture. These tours began in the spring semester, and counted as a Lab Tour/Company Tour credit for the initiates.

Figure 12: A group of PTS students touring Exactech

Figure 13: A group of PTS members touring Fracture

Polo Sales: The main source of fundraising for our chapter each semester is an official University of Florida Mechanical and Aerospace Engineering Polo Sale. Rather than being directly funded by our department, the department purchases the polos that Pi Tau Sigma designs, then Pi Tau Sigma advertises and holds the sale on campus to where we keep 100% of the proceeds. We held two sales this year, one in the fall and one in the spring, and each of the sales generated record-breaking numbers. In the fall, we sold 49 polos, and in the spring, 51. This money is used for social events funded by Pi Tau Sigma, initiation costs, and supplies for service events such as GatorTRAX. We make this event mandatory for all our initiates, where they are required to work at least one, one-hour shift at the sales table.

Figure 14: The sales table at the Fall Polo Sale

MAE Department Activities: Since our chapter is also one of the official UF Mechanical and Aerospace Engineering student societies, we are all heavily involved in our department. Our officers regularly attend meetings with our Department Chair to discuss the status of the society, and how we can be better representatives of our student body. We have also attended various external advisory board and review meetings where department heads from other universities, or executives of companies come to advise the progress of our department. We attend as student leaders who represent the general student body, providing feedback to these members of how the students feel about their classes, and resources provided by the department. Each year, our department hosts a Mechanical and Aerospace Engineering Banquet that honors alumni, professors, faculty and students for their tremendous efforts and achievements over the course of the academic year. At this past banquet, our President was awarded the MAE Student Leadership Award, our Social Chair was awarded the Gator Engineering Dean Earle Award, which honors the outstanding student leader in the Herbert Wertheim College of Engineering, and our Vice President was selected to be a part of the University Scholars program which supports undergraduate research.

Figure 15: Some of the Florida Sigma Omicron members photographed with the MAE Department Chair after being honored at the annual MAE Awards Banquet.

BEC Involvement: The University of Florida Sigma Omicron chapter of Pi Tau Sigma represented itself well during Benton Engineering Council (BEC) meetings, BEC-sponsored engineering outreach activities, community service, and social events. Members voted on matters regarding funding for the Herbert Wertheim College of Engineering (HWCOE), outreach opportunities, community service, and BEC council policies. Pi Tau Sigma members placed emphasis on expanding student opportunities for engaging with other engineering disciplines and gaining practical experience in real engineering scenarios for the purposes of professional growth, while not sacrificing academic performance or diminishing the capacity for students' personal growth. Pi Tau Sigma was represented during several prominent BEC events including the HWCOE Engineering Fair, Engineering Week, and Dance Marathon.

The Florida Sigma Omicron chapter upheld moral and professional character by responsibly inquiring the reasons behind funding changes for the HWCOE, voting ethically on issues that affected students in engineering, and maintaining moral and professional character during BEC-sponsored social activities. The Florida Sigma Omicron chapter served Mechanical Engineering by first considering the impact university or college changes would have on the Department of Mechanical and Aerospace Engineering, and served the engineering community by advocating for special consideration for engineering students during discussions of increases to university curriculum and course load requirements. The Florida Sigma Omicron chapter represented Mechanical Engineering students during council discussions regarding increased cross-disciplinary interaction, new facilities, and expanded engineering curriculum.

National Convention: The 2017 Pi Tau Sigma National Convention was hosted by Drexel University's Pi Tau Sigma chapter in Philadelphia, Pennsylvania. The Florida Sigma Omicron chapter sent 7 officers to the convention. All of the attending members took advantage of everything the Drexel chapter of Pi Tau Sigma organized for everyone. Throughout the weekend, along with attending all of the planned events, the attending members made sure to network and get to know fellow Pi Tau Sigma members from other universities, as well as explore and sight-see around beautiful Philadelphia.

Figure 16: The Florida Sigma Omicron officer board at the National Convention at Drexel University.

Conclusion

It has been an amazing year of memories and growth for the Florida Sigma Omicron chapter of Pi Tau Sigma. PTS has been involved in many activities across campus this year, and it will continue to do the same going forward, in an attempt to help as many students as possible, both professionally, and socially.