Pi Tau Sigma Annual Report

Drexel Xi Chapter

2011-2012 Academic Year

A. Initiations

Selection Process

The selection process for the Drexel Xi chapter of Pi Tau Sigma is dependent upon both the prospective member's academic record as well as their willingness to be involved in university activities. A list of prospective students in the Mechanical Engineering and Mechanics department at Drexel University who have met the academic requirements for the Pre-Junior, Junior and Senior class standing is provided by the Academic Advisor of the department to the President of the Drexel Xi chapter one month prior to the induction ceremony. The list is then screened by the Department Head as well as the Assistant Dean of Student Conduct and Community Standards so as to remove any and all prospective students who have violated the Drexel University Academic Honesty Policy. After the list has been screened, the President of Pi Tau Sigma Drexel Xi contacts each prospective member to invite them to be a part of the honor society. The stipulations set out in the invitation to be inducted into the honor society are: (1) Attend an informational meeting explaining Pi Tau Sigma and (2) Attend at least two events hosted by either Pi Tau Sigma or the Mechanical Engineering and Mechanics Department. These events typically fall under the classification of social, volunteer, or service upon which the prospective students are regularly invited to attend. Should members who have met the rigorous academic requirements, meet the additional informational and involvement requirements for the Drexel Xi chapter, they are then cordially invited to participate in the upcoming induction ceremony and subsequently solidify their role as a member of the organization for life. Additionally, for the induction ceremony for Spring term 2013, one member of the Mechanical Engineering and Mechanics department faculty was selected as an honorary member. Nominations for such are determined by the Executive Board for the Drexel Xi chapter, and an invitation was extended to this professor to request their participation in the induction ceremony as an honorary member.

Requirements

Each prospective member must meet the requirements set forth by National Pi Tau Sigma via the Constitution, and reinforced by the Drexel Xi Pi Tau Sigma Constitution. These academic requirements for Pi Tau Sigma Drexel Xi chapter are reflected as follows:

- First term Juniors upper 25% 17%, Last term Juniors upper 33% 25%
- First term Seniors upper 35% 33%, Last term Seniors upper 35% 33%

Within these ranges, Drexel Xi Chapter also requires a 3.5 GPA minimum. If there is not a reasonable number of students who meet the GPA requirement, as determined by the officers and advisor of the chapter, the range is opened to edge of the range but not past the 3.2 GPA Nationally required floor.

Additionally, the aforementioned information session attendance as well as proof of attendance at at least two events hosted by either the Drexel University Mechanical Engineering Department or by the Pi Tau Sigma Drexel Xi chapter is required of inductees. Above all, each inductee is required to pass an academic honesty screening conducted by the Department Head of Mechanical Engineering and Mechanics as well as Assistant Dean of Student Conduct and Community Activities at Drexel University. This ensures each student inducted into Pi Tau Sigma Drexel Xi follows the Drexel Academic Honesty Policy, maintaining the integrity of the organization.

Ceremony, Rituals, and Celebration

Induction ceremonies were held twice during the 2012-2013 academic year. The first induction ceremony was held during the Fall quarter, Friday, November 16th from 4:30-5:30pm in the Mechanical Engineering and Mechanics Seminar Room with all members of the Pi Tau Sigma Drexel Xi executive board in attendance. The second induction ceremony was held during the Spring quarter, Friday, March 10th 2013 from 6-7:00pm as well in the Mechanical Engineering and Mechanics Seminar Room with all members of the executive board in attendance. Our rituals uphold the script found in the Pi Tau Sigma National Constitution. Following the rituals of Pi Tau Sigma, a photo of the initiates with the present executive board was taken in the Main Building of Drexel University. After each induction ceremony, initiates were invited to celebrate their achievements with the executive board with a dinner paid for by Pi Tau Sigma Drexel Xi chapter. The majority of initiates attended the celebratory dinner and found it a great time to network and meet new members of the organization. All together 23 students were inducted into the honors society at the Fall 2012 induction. The induction class, along with the executive board, is pictured below.

Fall 2012 Pi Tau Sigma Drexel Xi Induction Class

The Spring 2013 ceremony accrued 29 new members. The induction class is pictured below.

Spring 2013 Pi Tau Sigma Drexel Xi Induction Class

B. Chapter Activities

Leadership and Service

At the start of the 2012-2013 academic year Pi Tau Sigma set a goal of opening a line of communication between faculty and students to better improve the effectiveness of course evaluations and general departmental improvements. The first step in the development of this line of communication was a survey submitted to sophomores, pre-juniors, juniors and seniors within the mechanical engineering department at Drexel to learn the strengths and weaknesses of our department from the student's perspectives. Over 160 and responses were recorded, organized and prepared into a presentation that was given at the May 2013 faculty meeting. With the introduction of Pi Tau Sigma as the official student representative at faculty meetings we hope to use this direct link to faculty to improve the interdepartmental interactions of students and faculty, and increase the educational fulfillment of mechanical engineering students at Drexel University. Our presence at faulty meetings will remain a bi-annual occurrence where we will present both new findings in regards to our peers experiences as well ensure that the department has taken steps to pursue these changes.

Drexel Xi was selected to pick several of its members to appear before a program alignment review (PAR) board evaluating the strengths and weaknesses of the mechanical engineering department. The board was made up of three professors from Georgia Tech, University of Pennsylvania, and University of Southern California. This interaction consisted of an interview, emails, and a comprehensive report based on the student survey conducted earlier in the year. In its final report, the PAR committee noted as one of the departments four main strengths, "Quality/motivation of undergraduates--The panel were impressed by the fierce engagement and loyalty of the undergraduates." The PAR report and Drexel Xi report together sparked discussions on a greater mechanical engineering budget, emergency funds to replace old student laboratory equipment, and an initiative for more student/faculty engagement throughout the department. The results of this endeavor can already be seen in updated facilities and improved communication throughout the mechanical engineering department.

In February 2013, Drexel Xi worked with ASME to develop an undergraduate committee of 15 students to interview possible candidates for a new department head position in mechanical engineering. After interviewing 4 different candidates, completing surveys and reports on each, and meeting with the dean and graduate students to discuss preferences, the favorite of the undergraduate committee was selected for Drexel's new mechanical engineering department head.

In April 2013, Drexel Xi headed an undergraduate committee for interviewing candidates for new faculty positions. The committee consisted of 13 students, 10 of which were Pi Tau Sigma members. Through a rigorous interview system with seven candidates culminating in surveys and reports on each candidate, Drexel Xi was able to recommend its top choices for the open position. The favorite of the committee was selected and has accepted a position beginning in the fall.

The members of Drexel Xi also serve as representatives at MEM department Open Houses and Accepted Student Days, fielding questions from prospective students and their families about the department and student life. Many of the officers also serve on panels within the department, acting as the student voice on matters such as tenure for professors, student life, department activities, and ways to make the department better.

Our university is lacking in support services in the form of tutoring or a resource center for students beyond the basic freshman and sophomore level courses. To assist those students struggling in higher-level engineering courses, we have reached out to our student members for available tutors. We have collected a list of volunteers and are matching each new student request for a tutor with an appropriate honors student. This strengthens the academic knowledge of not only the struggling student but the tutor as well.

On Saturday, October 13, 2012, the Drexel Xi chapter volunteered at the Drexel CAN DU community service event along with the Community Alumni Network at Drexel University to revitalize a playground at Drexel's Vidas Athletic Complex, which is utilized by the surrounding West Philadelphia and Powelton Village neighborhood. During this community service experience, 108 Drexel alumni, student, faculty, staff and friends volunteered to refresh the community playground area at the Vidas Complex, which included repainting the existing basketball court, backboards and nets; painting colorful playground games; clearing overgrowth and debris; painting fence posts; planting new shrubbery; laying mulch; and assembling and installing two park benches and two trash receptacles.

In two different sessions in the fall and spring, Drexel Xi continued its relationship with a local all-girls Philadelphia High School, the Merion Mercy Academy. Drexel Xi members conducted workshops on Google SketchUp in an effort to excite students about engineering and STEM fields. These workshops were an hour-long each and were well-received; the attending students requested increasing in the number of these workshops in the future.

Our chapter has also worked to volunteer at local Philadelphia institutions and events, such as the Philadelphia Science Festival and at events at the Franklin Institute. The Vice President of the Franklin Institute has requested the Drexel Xi assist in organizing the 2014 Franklin Institute Awards, an extremely prestigious and renowned event.

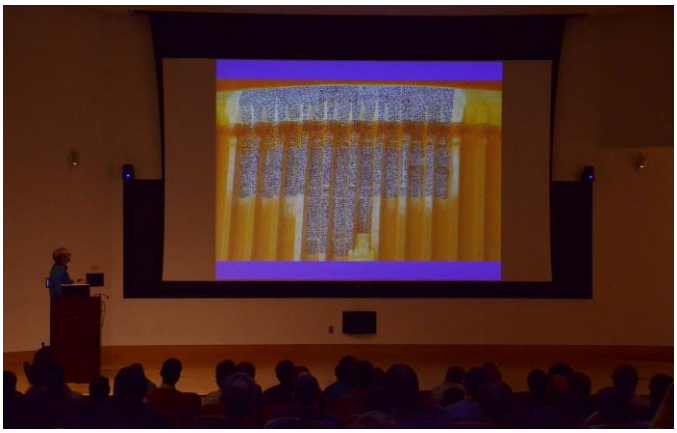
Professional Events

Drexel Xi's faculty advisor, Dr. Antonios Kontsos, came to us early in the 2012-2013 academic year with the idea of having his associate Matthew Melis come give a talk. Pi Tau Sigma organized, in conjunction with Drexel's ASME chapter, the hosting of Matthew Melis during the Winter 2013 term. On Wednesday March 13th, 2013 Drexel Xi and Drexel's American Society of Mechanical Engineers worked together to bring Dr. Matthew Melis to Drexel to present on his work as a ballistic researcher at NASA's Glenn Research Center. Dr. Melis' expertise is in finite element modeling and analysis methods for nonlinear and dynamic impact loading. He is known as an expert in stress analysis, ballistic impact research, actively cooled structures, and multiphysics analysis. NASA has employed him for a variety of programs, ranging from the International Space Station to the Space Shuttle to NASA's Exploration Program for a return to the moon. He is most famous for his work as technical lead of the NASA Glenn Ballistic Impact team which investigated the factors contributing to the Columbia Space Shuttle disaster. He currently works with NASA's Simulated Lunar Operations facility which tests and develops planetary rovers and wheels.

The day began with tours of the relevant and cutting-edge labs that Drexel has in the areas of space systems and ballistics. These lab tours included the Drexel Space Systems Lab with Dr. Yousuff, Dynamic Multifunctional Materials Lab with Dr. Lamberson, ExCITe Center with Dr. Fontecchio, and Theoretical and Applied Mechanics Lab with Dr. Kontsos. These tours were broken up by meetings with the MEM Department Head Dr. Miller and Vice Dean Dr. Bruce Eisenstein.

Following a dinner with the officers and members of Drexel Xi and ASME, Dr. Melis was brought to stage in Bossone's Mitchell Auditorium. The auditorium was filled with approximately 200 students, faculty, and guests. After a warm welcome from Drexel PTS President Sean Rossiter and ASME President Leila Aboharb, Dr. Melis began a discussion of the many interesting aspects of working at NASA's Glenn Research Center. The talk began with an overview of how a space shuttle is designed, constructed, and tested. This information was complemented by jaw-dropping videos and pictures displaying the immensity of both the shuttle and the entire undertaking. Dr. Melis then expanded his talk to discuss the process of ballistics research to determine the faults in the Columbia Space Shuttle Disaster. The relatively mundane subject of materials testing was made dynamic and exciting through both Dr. Melis' stories and videos demonstrating the incredible power of momentum as a destructive tool. Through the use of high speed cameras and video processing Dr. Melis was able to conduct extensive structural analyses on the shuttle as well as to create jaw-dropping footage of space flight.

This two hour presentation was so well received that students were lined up for an hour past the event waiting for the opportunity to ask questions to the speaker. This extended into the reception, where a catered spread was served to foster conversation among the attendees. Many students and guests approached the officers of PTS and PTS asking for similar future events.

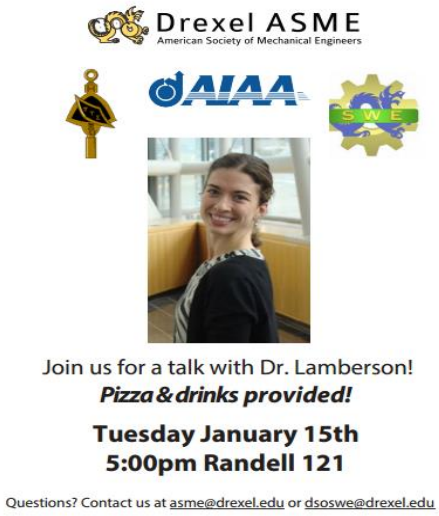


This entire event, funded in part by the College of Engineering, Mechanical Engineering Department, PTS, and ASME, was a resounding success. The talk served to inspire students with the exciting real-world applications of their coursework, as well as adding to the community and inclusiveness across the college.

Through Drexel's expansive co-op employer directory and Pi Tau Sigma alumni we set out to host several industry representatives to come speak with students about opportunities that exist for them in the world of engineering. In the past these have come primarily from larger corporations with little exposure to the smaller companies that are always looking for competent employees. Pi Tau Sigma realized this and reached out to a Drexel alumni and CEO of a local

high end manufacturing company, Acero Precision. Michael Fitzgerald, Acero's founder and CEO, spoke of his experiences starting Acero and where he views manufacturing in the US is headed in the future. Student attendees commented on the unique exposure to speaking with someone that has started their own engineering firm and his insight into the increasing demand for high quality made in the US manufactured products.

Drexel Xi believes strongly that students should develop greater interactions with faculty members in the Drexel Mechanical Engineering Department. To aid in this goal, Drexel Xi partnered with ASME, AIAA, and SWE to reach out to the department's newest faculty member, Dr. Leslie Lamberson, for a talk on her past research and future goals. This event was very well received and brought out over 75 students.



Social Events

To promote camaraderie and amiability amongst its members, Pi Tau Sigma Drexel Xi held a number of social events during the 2012-2013 academic year. The first was a rock climbing event, where students were able to relax and get some free climbing in at the Drexel rock wall. This was followed by a trip to the seaport museum, where students toured a WWII submarine. We also had a Valentine's Day ice skating event with the Society of Women Engineers, and a tour at a local brewery. During the 2013 Philadelphia Science Festival we held group outings to many of the festival's social and professional events. At the end of each term we hosted finals week study breaks, and culminated the year with an officer retreat to Cape May, New Jersey.

Fundraisers

The Drexel Xi chapter currently has three means of funding for the organization. The first is from dues; at the time of initiation, students are asked to pay $45, $35 of which is for national dues and $10 of which is designated for the Drexel chapter. The next portion of funding comes from proposals written by the executive board addressed to different offices within the University, as well as corporations looking to sponsor the Drexel Xi chapter. For instance, the 2012-2013 academic year saw the generous gifts of $1,100 from the office of the Dean of the College of Engineering, as well as $1,000 from ExxonMobil. The generosity of these entities cannot be underestimated, yet neither can the work put forth by the President, Vice President, and Treasurer of Drexel Xi to draft the proposals and conduct outreach in a timely and professional manner. The remainder of funding for convention and events is subsidized by the Student Activity Fee Allocation Committee (SAFAC), which Pi Tau Sigma applies for each year.

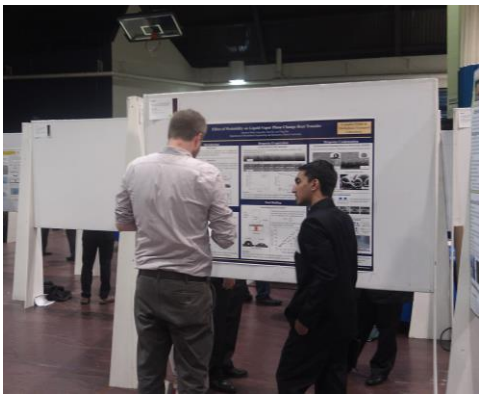
Information Sessions

As an organization based on academic excellence the Drexel Xi chapter of Pi Tau Sigma was saddened to find that only a handful of mechanical engineering students took the Fundamentals of Engineering exam in the 2011-2012 academic year. For the 2012-2013 academic year we took it upon ourselves to increase our peer's involvement in this exam. Pi Tau Sigma split its involvement between hosting information sessions covering exam specifics, the

registration process and why students might be interested in taking the exam and helping the senior design course sequence develop and implement a FE exam review series. While results have not yet been divulged for the number of students in Drexel's mechanical engineering department that took the FE exam this year, from speaking with peers it is expected that Pi Tau Sigma's involvement has led to a large increase in the number of students that took the exam.

Additionally, Drexel Xi has aided its students in communicating and organizing an event with the Drexel University Fellowship Office. The inception of this event began with the networking of executive board members at University wide events, highlighting the importance of reaching out to resources within the university that might not typically be at hand for the chapter within the department alone. The event was geared towards informing students about nationally and internationally prestigious scholarship programs that help them get the education and experience they need to pursue your professional goals, among them were the Goldwater Scholarship, NSF Graduate Research Fellowships Program (GRFP) and the DAAD Research in Science and Engineering Internships (RISE).

University Events



Various University projects and events were sought out by Pi Tau Sigma Drexel Xi Members throughout the 2011-2012 academic year to provide service and integrity to Drexel University at large. One of the largest events at Drexel University, Drexel Research Day, which incorporates research from various facets of the colleges of Drexel University, was a perfect time for Drexel Xi to get involved. Members volunteered their time to present some of their research while representing Pi Tau Sigma at the event. This past year, members have also served as judges and helped set up Drexel Research Day, a showcase and competition of undergraduate and graduate research at the University. The Mechanical Engineering Department had the highest participation rate of all engineering departments this year, both as volunteers and contributors.

Every year Drexel's College of Engineering holds a week of festivities to celebrate national engineer's week. For the 2012-13 year the college reached out to different engineering student organizations to help organize and run events. Drexel Xi volunteered to lead a faculty jeopardy event, wherein a faculty member from each engineering department was selected to compete in a series of freshman-level engineering categories. The event was a big success, with over 150 attendees there to root for their respective department.

Several events for prospective and accepted students which are scheduled throughout each quarter at Drexel University had several representatives from Pi Tau Sigma sharing experiences and knowledge not only of the Drexel University system and atmosphere but of Engineering and more specifically Mechanical Engineering so as to better inform those considering a similar path of study. Additionally, Pi Tau Sigma Drexel Xi participated in University-wide organization town hall. Finally, members of the organization participated in the

annual Senior sendoff events, helping organize and host the reception. The following is a list of University events which Pi Tau Sigma Drexel Xi aided or participated in:

- Drexel Research Day
- Accepted Students Day
- Mechanical Engineering and Mechanics Open House
- College of Engineering Open House
- Student Life / Office of Campus Activities Town Hall
- Senior Send-off

Chapter Meetings

Drexel Xi chapter meetings were held at various levels of operations within the organization. Throughout each quarter (Fall, Winter, & Spring) of the 2012-2013 academic year, weekly meetings were held for the officers of Pi Tau Sigma. Meetings were typically at around 5:00pm or 6:00pm in order to accommodate the schedules of those at Drexel with class as well as those on co-op. These meetings were one hour long with a detailed agenda, subsequent action items, and minutes dictated by the Recording Secretary. Additionally, planning meetings were held at the beginning of the term to sketch out a schedule of desired events and involvement of the organization. The planning meetings were generally two hours, and had an open discussion forum, with secretaries recording consensuses and responsibilities. General body meetings were also held by the chapter to ensure transparent, consistent communication between the executive board and its members. In addition to the regular meetings, there was also the matter of electing the new members of office. Members were elected democratically within the organization, some of which went unopposed, but nonetheless were announced to the general body on March 4th 2012.

National Convention

National Convention, held at Ohio State University on February 22nd thru the 24th was an instrumental step in the progression and alignment of Pi Tau Sigma chapters both nationally and internationally. Three Drexel Xi officers attended the Convention (Sylvia Herbert, Samson Shepherd, and Sean Rossiter), in addition to the chapter's faculty advisor, Dr. Antonios Kontsos (one of the only advisors represented at the conference). Unfortunately, due to the inclement weather in the Ohio area, our chapter was unable to participate in the various discussions and deliberations held throughout the first day. However, the representatives were motivated to attend the talks and informational sessions throughout the convention and get involved at the ground level with other chapters. Drexel Xi was fortunate to win the Secretary Commendation award for its work on the annual report the previous year. However, Drexel Xi was exempt from being considered for national recognition of service and performance due to employee turnover within the office responsible for fulfilling check requests. Not only were the officers busy, but the faculty advisor Dr. Kontsos was busy meeting with regional heads of National Pi Tau Sigma, as well as the President and Vice President, in order to

gain a better insight into the direction of the organization and the sustainment of the excellence and integrity which it exudes. Benefits of attending the National Convention were found to be limitless by the officers that attended, it truly resounded as one of the most important events and activities of the chapter throughout the entire 2012-2013 academic year.

C. Other

Awards and Recognition

To promote excellence in mechanical engineering, Drexel Xi distributed awards for the best posters at the Drexel University Research Day. Throughout the day Pi Tau Sigma officers, as well as the faculty advisor Dr. Antonios Kontsos, faculty member Dr. Matthew McCarthy, and Mechanical Engineering Ph.D. student Jeffrey Kahn walked around to view all posters within the Mechanical Engineering and Mechanics Department. Previously it had been announced that cash prizes would be awarded to MEM students who displayed the "best" research that day. The results are shown below:

- *First Place* ($250 prize) **Arvind Kalindindi**, Co-Author(s): Reyhan Taspinar
  The Effect of Imperfect Interfacial Contact on Polymer Electrolyte Fuel Cell Performance
  Advisor(s): Dr. Emin Caglan Kumbur
- *Second Place* ($150 prize) **Alison Krick**, Co-Author(s): Andrew Ellenberg, Lara Branco
  Unmanned Aerial Vehicle for Infrastructure Evaluation
  Advisor(s): Dr. Antonios Kontsos, Dr. Ivan Bartoli, Dr. M. Ani Hsieh
- *Third Place* ($50 prize) **Veronika Legkobitova**
  Effect of Brain Stem Displacement on Traumatic Brain Injury
  Advisor(s): Matthew Maltese

Graduating Seniors

Commencement – June 14th 2013

Alison Krick	Derek Feverston	Ken Leung	Reginald Smith
Amey Khanolkar	Devashish Bhargava	Libu Geevarghese	Samson Shepherd
Anubhav Gupta	Dipankar Shrigyan	Mark D Kuhn IV	Sean Rossiter
Arvind Rama Kalidindi	Dominic A Sciulli	Matthew Annen	Selin Sahici
Atiqah Shahrin	Greg Dobbs	Michael F Martin	Thomas J Milligan
Benjamin H Wright-Rowan	James Sullivan	Michael Rose	Tim Andrews
Clara Engel	John Benko	Nicholaus Meyers	Tim Steffel
	John S Piotrowski	Nick Pizzuti	Vedant Bhootra
	Ken Leibig	Paul Holleger	Zachary Albino

2012-2013 Academic Year Officers

Elections Announced – March 4th 2013

President: **Sylvia Herbert**
Vice President: **José Uzcategui**
Treasurer: **Anthony Iacono**
Corresponding Secretary: **Graham Donaldson**
Webmaster: **Mitchell Barish**
Recording Secretary: **Justine Malandra**