PI TAU SIGMA ANNUAL CHAPTER REPORT
2016-2017
Cooper Union Pi Phi

A. Initiations

For the 2016-2017 academic year, Cooper Union Pi Phi held two initiation ceremonies for Pi Tau Sigma, one in October and one in March. The Fall Initiation was held on October 6, 2016 and 9 members were inducted including 3 seniors and 6 juniors. The Spring Initiation was held on March 23, 2017 and one junior and 5 seniors were inducted. Both initiations were invitation-based and all students interested in joining Pi Tau Sigma were asked to submit a statement of intent explaining their qualifications and why they would like to be admitted to Pi Tau Sigma. The students who were inducted met the GPA requirement of 3.25/4.0 and ranked in the top 33% of their class. The initiation ceremony was held in a dimly lit room and the President and Vice President read the standard oaths. A few of the currently enrolled Cooper Union Pi Phi members attended the ceremony. Both ceremonies concluded with a meal of pizza and a short speech from Cooper Union Pi Phi's advisor, Professor George Delagrammatikas, explaining our chapter's focus on local outreach.

B. Chapter Activities

a. FE Review

The Cooper Union Pi Phi chapter started the year by running a Fundamentals of Engineering Exam Review Questions of the Week program. The program consisted of sending out review questions to students who expressed interested in studying for the FE exam. Each week, our secretary of internal affairs selected approximately eight review questions from various review books and emailed them to participants. The participants were asked to submit their answers and our secretary kept track of the number of correct answers each student submitted. The following week, the PTS coordinators sent out the solutions to the previous week's questions in addition to the new questions for the week.

b. STEM-Days

In addition to the FE reviews, Cooper Union Pi Phi focused on developing meaningful outreach events and opportunities for local schools. A majority of our members participated in at least one STEM-Day, and a select few actively led these events. Outlined below are some of our most popular activities that we often ran.

1. Build a DC Motor: Students were given basic instructions on how to build a DC motor and how they work. They were then divided into groups of 5-6 and were given the materials to build a motor. The students capable of making the first, fully functioning motor amongst the teams were crowned winners.

2. Build a build/truss-system for holding the most weight. Students were divided into groups of 5-6 and given laser cut pieces of thin cardboard. Using 6 pieces (6 in by 1 in) and only 1 foot of tape, they were instructed to build a structure that would fit

inside a box of a given set of dimension (6 in^3) which could hold the most weight. A string was tied to the structure and standard masses were attached to the string to see the weight carrying abilities of each design. Very competitive experience for students.

3. Students were given a tour of the school and taken to the formula lab where interactive demonstrations of various topics took place. Some topics covered included:
    - The workings of a pneumatic engine
    - The workings of a fully functioning "transparent" combustion engine
    - What was a DC motor and how did friction work in its development
    - How do planes fly and land
4. Flame lab
5. Tour of Anechoic chamber. Brought in balloons and popped them and did activities that made students understand the reasons why the chamber worked the way it did.

These events brought students from local New York City schools to the Cooper Union for demonstrations and activities run by PTS members and sometimes included volunteers from other societies on campus. The schools we hosted are outlined below:

i. The Chapin School

Six 12th grade students from an all-girls school, and their accompanying teacher, arrived at the Cooper Union on November 9th, 2016 to participate in a school tour and learn about engineering. The day started at 10 am and concluded at 2 pm, and all activities were led by three Pi Tau Sigma members and two SWE members, and advised by our faculy advisor, who is the main lead for outreach programs at the Cooper Union.

The day started with a meet-and-greet and tour of our engineering building. We showed them around the Formula SAE lab, and gave a short lesson on engines, accompanied by a demonstration of the Engine DYNO and the Acetone Engine. The next activity was a build-and-break using the Instron, and then the day concluded with a Q&A.

ii. Fieldson Ethical Cultural School

On November 16th, 2016, twenty 8th grade students from the Fieldson Ethical Cultural School arrived at the Cooper Union to participate in a STEM-Day. The day started at 10 am with a tour of our engineering building, then several little activities that we often use during our STEM-Days.

iii. Cathedral High School

On March 9th, 2017, our PTS volunteers collaborated with several Society of Women Engineers (SWE) members to host Cathedral High School, with discussions and activities about engineering.

iv. William McKinley – Brooklyn – IS259

On March 3rd and 10th, 2017, we hosted several 8th grade students from the William McKinley School, who was accompanied by their teacher, a fellow Cooper Alum.

c. STEM-Saturdays

During the Fall 2016 semester, Pi Tau Sigma members continued the second year of an outreach program at the Cooper Union called STEM-Saturdays. The 10-week program ran twice a year, in the spring and fall semester, and gave underprivileged students from nearby high schools the chance to explore STEM and use technology not available to them at their own schools. Each Saturday from 10 am to 3 pm, starting at the end of January until the beginning of May, sixteen high school students from La Salle Academy and St. George Academy would come to the Cooper Union to learn about various aspects of engineering and STEM and participate in related activities. Pi Tau Sigma members were responsible for designing the 10-week curriculum, teaching the curriculum, recruiting additional teachers, and managing all other logistics and administration in conjunction with our faculty advisor.

The teachers and lab operators who supervised and ran the program were either Pi Tau Sigma members or other engineering students from the Cooper Union. There was a leading team of about four instructors who were present almost every week and ran the program, dealing with everything from administrative matters to curriculum planning to classroom instruction, and half the leading team were PTS members. Additionally, ten of our members dedicated anywhere from one Saturday to several Saturdays. In total, about 75% of our members participated in this effort in some way.

The curriculum and activities included lessons on coding, microcontrollers (Arduinos), SolidWorks, and different methods of manufacturing, like 3D printing and lasercutting. The students applied what they learned to a larger project. Students worked in teams of four on an original idea of their own, guided by a mentor, and worked on their presentation skills as well. At the end of the 10 weeks, the students were asked to give feedback which were overall positive.

d. PTS National Convention

Aside from outreach, Cooper Pi Phi participated in other events such as the Pi Tau Sigma National Convention at the Drexel University in Philadelphia, PA. This year, Cooper Pi Phi sent two students to the National Convention who enjoyed their time meeting with students from other colleges.

e. End-of-Year Party and Elections

On May 4th, 2017, Pi Tau Sigma members met once more for nachos and cookies to celebrate the end of the semester (before finals). Elections also took place, and PTS members who were juniors nominated and voted for next year's board members. The current board members used the time to answer questions about the roles and expected responsibilities. The meeting was a great way for PTS members to destress, get some free food, and give the chance for juniors to ask questions about what to expect during their senior year.