

## Material Advantage Chapter of Excellence Application

### University of Illinois Chapter

Prepared by Kyle McKillop



*2017-2018 Executive Board*

**Top Row** (left to right): Monica Paul (EOH Director), Tejas Idate (Service Chair), Rangarajan Thiruvengadam (Secretary), Ian Harris (co-Polymers Representative), Adam Ladd (co-Polymers Representative), Devon Goszkowicz (Social Chair), Ethan Wisniewski (Professional Chair)

**Bottom Row** (left to right): Jacob Dutler (Metals Representative), Matthew Landi (Electronics Representative), Heer Majithia (Vice President), Kyle McKillop (President), Eric Krupinski (Treasurer), Daniel Rosenthal (Ceramics Representative)

## **Chapter Overview**

Material Advantage (MA) is a professional society for students in Materials Science and Engineering. The University of Illinois (UIUC) Chapter is a student organization for undergraduates in Materials Science & Engineering (MatSE) at the University of Illinois at Urbana-Champaign. Our goal is to keep the student body informed as to the opportunities available within Materials Science and to serve as a liaison between the students and faculty. As the largest undergraduate Materials Science & Engineering program in the country, ensuring all students remain up-to-date on recent developments in the field is no easy task and requires lots of hard work on the part of our executive board officers.

Our chapter is run by a 17-member executive board, composed of MatSE undergrads ranging from freshmen to seniors. Our board has traditional MA roles (president, vice president, treasure, secretary), chair roles (social, professional, service) whose jobs include planning events for their respective titles, as well as specialized concentration representatives (students studying metals, polymers, biomaterials, ceramics and electronic materials science and engineering) who host events related to their fields of interest. The diversity and size of our board allows us to undertake numerous events throughout the year and this document serves to summarize and describe them to demonstrate that the UIUC Chapter of MA has satisfied the Excellence Criteria and deserves to be considered for the 2017-2018 Material Advantage Chapter of Excellence Award.

## **Programming**

### *Fall 2017*

The beginning of a new school year means three major things for MA at UIUC. First, as an ever-growing organization, it is our goal to recruit as many new MatSE freshmen as possible to join our organization. Our first formal recruiting event occurs at the UIUC College of Engineering's E-Night. This student organization 'fair' gives organizations like MA an opportunity to set up a booth on the engineering quad and talk to freshmen present at the event about our chapter and what we do within MatSE. Any interested freshmen are added to our newsletter email list and to our Facebook "MatSE Support Group" page. However, not all freshmen are able to attend this event, so the MA officers take it upon themselves to visit MSE 182, the introductory freshmen MatSE class, to introduce themselves and MA, as well as to collect contact information. Once we as an organization have introduced ourselves to the new class of MatSE freshmen, we kick off our mentorship program, which pairs up freshmen with an upperclassman in MatSE to serve as a mentor, point of contact and a friend.

Our second goal is to build a healthy social community within the MA chapter. Our 'welcome back' event this year was an afternoon BBQ, where students could gather before the school year started rolling and hang out, enjoying tasty meat-based and vegetarian grilled food. With the start of a new school year, we also started up our weekly Happy Hour, a Friday afternoon event when MatSE students can come together after a long week of school, eat nachos and bond. Other fun Fall-themed events hosted by MA included pumpkin carving for mentor-mentee pairs, a Halloween scary movie night, a group field trip to Curtis Orchards Pumpkin Patch, a Thanksgiving-themed "Friendsgiving" potluck and an evening of ice skating. MA also hosted a bar crawl each semester, where members of the legal drinking age spent an evening socializing with their peers outside of the classroom.

The third aspect of a MA fall semester is professional development. Our department boasts extremely motivated, hard-working students, 5 of whom volunteered to speak at an internship panel early in the semester. Here, they presented on their areas of work and answered questions posed by MatSE students about the nature of their internships, their employers and any general questions about finding a job as a materials engineer. The MA exec board also hosted a peer advising panel in the fall, where younger students could come and listen to the

Concentration Representatives discuss the classes they took throughout college and ask questions about their content. Another longstanding tradition in the fall is the hosting of a technical writing workshop. Since the MatSE curriculum includes the dreaded junior year lab courses, an officer of MA who has survived these classes holds a ‘crash course’ in lab report writing, where juniors can see a properly formatted report and ask questions about what to include and what not to include. Also, with the fall comes the Engineering Career fairs, and MA sees it as their job to prepare students to secure a full-time job or internship. Using our connections in industry, MA was able to get recruiters from companies such as 3M, Clorox, Oak Ridge National Lab and Chevron to give tech-talks to MatSE students regarding opportunities at their respective companies, allowing MatSEs to network and get valuable contact information.

It was around this time that MA sent 12 students to the MS&T conference in Pittsburgh, PA. While here, students attended the chapter workshops, listened to speakers from various industries and universities, competed in the student speaking and mug drop contests and explored the city of Pittsburgh, bonding with their classmates and exec board members.



*MatSE students in Pittsburgh at MS&T*

A new professional aspect of MA was the student-started “Women in MatSE” organization: three female members of the exec board hosted several professional and social events for women MatSE students aimed at creating a support network for them and their female colleagues.

Outside of school, MA uses the fall as an opportunity to give back to the Champaign-Urbana community. The first service event of the year was Destination Technology, an event

hosted by Caterpillar where engineering students travel to Peoria, IL to teach scientific and engineering concepts to middle and high schoolers. Also, around the holidays, MA organized a Toys for Tots fundraiser, where MatSE students were able to donate toys and money to children in need in the Champaign-Urbana area.

### *Spring 2018*

The spring semester brings another career fair, and so MA jumped right in, setting up several professional events for students. A peer resume review was organized, where upperclassmen took the time to review younger students' resumes and give suggestions for improvements. MA also hosted a MatLab session, where students were invited to come brush up on or learn more about this powerful and popular tool. Again, companies were invited to talk to MatSE students, one of which was Oak Ridge National Labs. Once April rolled around, MA gathered several students planning on attending graduate school to host a panel where juniors could come ask questions about the application process.

As is tradition, spring brought Engineering Open House, which MA always takes part in. As an organization, we planned five unique demos pertaining to the polymers, biomaterials, metallurgy, ceramics and electronic materials. Our largest fundraising took place during EOH, as MA sold cotton candy while explaining the science behind its production, netting the organization over \$1,400.

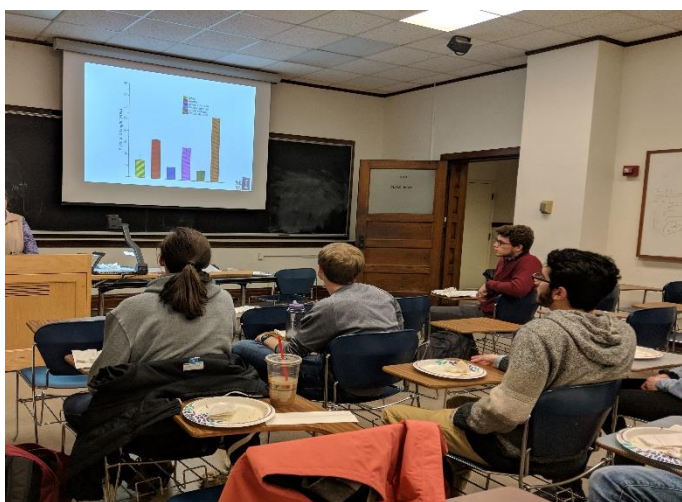
During EOH, MA again partnered with Destination Technology, giving tours to the same students we visited in the Fall and explaining the materials science behind our demos. Along the lines of service, in the spring MA also partnered with the Society of Women Engineers for their Introduce a Girl to Engineering day, where several MatSE students spent an afternoon teaching high school girls the materials science behind the production of chocolate.

Socially, MA was just as active during the spring. We hosted a broomball tournament with the Biomedical Engineering Society and Eta Kappa Nu, took a trip to St. Louis, MO to spend an afternoon socializing with the Missouri Science & Technology MA chapter, held another bar crawl and organized a mentor-mentee dessert potluck. Our final social event was the MA auction, where students auctioned off goods and services to their classmates (baked goods, Mathematica classes, field trips etc.), with the proceeds going to the chapter.

## Career Development

As was mentioned in the first portion of this report, a main goal of MA is to assist our members in finding an internship or job. Starting with our first professional event, our student internship panel, we sought to introduce younger members to the various fields materials engineers work in. Our student volunteers had interned at companies including 3M, GE, Honda R&D and were able to answer questions about applications of polymers, metallurgy and ceramics in industry. Once those specific questions were answered, the session turned into a more general panel, with older students sharing tips and tricks for nailing interviews, excelling at work during internships and professionalism in general.

Closer to the career fair, our Professional Chair Ethan organized a peer resume review, where several upperclassmen volunteers took an hour of their time and used it to read and edit the resumes of younger MatSEs. This provided a casual, friendly environment where motivated students could get insight into the proper ways to write a resume and use the critiques to come prepared to the career fairs. Also, during the career fair, our members used their industrial connections to get guest speakers from companies like Chevron, 3M and Oak Ridge National Lab to come to speak to MatSE students about the opportunities at their companies. Students who were too busy during parts of the career fair or who wanted a more intimate conversation with these recruiters could use the opportunity to get their resume to these companies and potentially land a job.



*Students at a company-sponsored tech-talk*



MA also seeks to develop our students inside the classroom as well. Using our Concentration Reps, we held a peer advising panel, where these 5 volunteers set up a panel to describe their concentration areas and take questions about coursework, classes they would recommend and the fields they'd worked in. This went over well with new students, since a new major with 5 concentrations can be intimidating, but hearing from students who have been in their shoes before is always helpful.



*Concentration Reps Adam, Dan, Matt and Ian at the advising panel*

Also, since not all of our students go right to industry, MA set up a panel of 5 seniors pursuing a graduate degree after graduation. These students had been accepted into PhD and Masters programs in MatSE at schools like Northwestern, UCSB and UIUC and were able to hold a conversation with rising seniors about the application process, things they wish they'd known beforehand, personal statement writing and choosing an advisor.

Brand new for the 2017-2018 school year was the "Women in MatSE" organization. Started by exec members Monica Paul, Naomi Benson and Devon Goszkowicz, this offshoot of MA seeks to bring together the female members of our major and form a support network for women engineers. While still a new organization, these amazing ladies held several social bonding events, such as a spa night and coffee chats, with the intent of adding more professional development events for the 2018-2019 school year.

## Service

Our chapter of MA has developed a relationship with Calvin Coolidge Middle School and has, for the last few years, been invited to give a demo at their Destination Technology outreach program every Fall. This program is sponsored by Caterpillar, a Peoria-based company, and seeks to teach junior high students about the importance of critical thinking in designing engineering solutions. This year, our demo was centered around water and taught the students about the buoyancy and hydrophobicity/hydrophilicity of various materials, as students were tasked with building boats out of either paper, wax paper, card stock or aluminum foil and then using materials like tape and popsicle sticks to reinforce them. If their design floated, then weights were added to the ship to test the structural integrity.

MA also volunteered for Destination Technology again in the spring, this time at Engineering Open House (EOH). Three board members volunteered to lead tours of students through all of the EOH exhibits, explaining the science to them and helping them see all of the exciting fields of engineering. Outside of Destination Technology, MA was still busy at EOH. Our EOH Director Monica Paul was responsible for organizing all of the MA and MatSE exhibits at the two-day event, designing our T-shirts, managing our Concentration Reps and their five demos aimed at teaching about the main areas of materials science and writing and directing a MatSE-themed EOH video.



*Metals Rep Jacob Dutler and MA member John Shimanek explaining their EOH demo*



MA also partnered with the Society of Women Engineers (SWE) for their Introduce a Girl to Engineering Day (iGED). This outreach event hosts high school girls at UIUC and gives them a day to view demos set up by various engineering disciplines to learn more about Engineering at Illinois. MA hosted a demo explaining the materials science of chocolate production, which demonstrated how various phases of the chocolate phase diagram have different properties, textures and flavors and thus careful temperature control is necessary to produce the chocolate we all love.

Finally, around the holidays, MA chose to give back to the Champaign-Urbana community, organizing a Toys for Tots drive where MatSE students were able to donate toys to underprivileged children and raise money to fund the organization. In total, over \$100 and several dozen toys were donated by our students.

### **Social Activities**

As was mentioned in the programming section, our chapter loves capitalizing on fall and its beautiful weather. Our first week back to campus, MA held a BBQ for our members, giving older students a chance to catch up with old friends and new students a chance to make new friends. We spend the afternoon in a park grilling food, tossing frisbees and talking about life.



*Grill master Collin*

We also hosted a trip to Curtis Orchards, a local farm, where members could spend the afternoon picking pumpkins and apples, eating cider and donuts and satisfying their annual quota of “basic” fall Instagram pictures, as well as a mentor-mentee pumpkin carving contest, where new and old members spent an October morning carving festive pumpkins.



*(left) Exec members Kyle and Monica at Curtis Orchards and (right) Devon and her mentees and their pumpkins*

The end of the fall semester was marked by a “Friendsgiving” potluck, where our culinarily-inclined members tested their skills and prepared some tasty fall-themes foods, and our fall bar crawl, where members of the legal drinking age were invited for a night out on the town to blow off steam and forget about the stress of college for a few hours.

Back on campus for the winter, we continued with seasonally-themed events, hosting a friendly broomball tournament with the Biomedical Engineering Society and Eta Kappe Nu, the ECE honors society (which we won, going 3-0).





*The undefeated MA broomball team. Sai was injured on the field of battle but still gave his all*

Devon also organized a combined St. Louis trip with the Missouri Science & Technology MA chapter, where our students met for the day to tour a glassblowing studio, Anheuser Busch's brewery and the St. Louis Arch and bond with other MatSE students.



*MS&T and UIUC MA chapters in St. Louis*

As is tradition, the spring semester is concluded with the MA auction, where students and professors auction off goods and events, with the proceeds going to MA. This year, students won a trip to the Field Museum, a Kuub game with Professor Robert Maass, some delicious baked goods and an afternoon beer tasting, among other things.



*Winners of the Kuub challenge spending the afternoon with Professor Maass*

## Chapter Management

### *Executive Board Positions*

<b>Position</b>	<b>Role(s)</b>
President	Oversee all MA events; point of contact for department; leads all meetings
Vice President	Assistant to the President; mentorship program leader
Treasurer	Handles all chapter funds and purchases; collects dues
Professional Chair	Leads career development events; point of contact for recruiters
Social Chair	Lead all social events
Service Chair	Leads all service events
Secretary/Webmaster	Sends out newsletters; maintains website

EOH Director	Plans, organizes and leads Engineering Open House
Metals Representative	Answer questions about MatSE concentrations and classes; plan and lead EOH demos.
Polymers Representative	
Ceramics Representative	
Biomaterials Representative	
Electronic Materials Representative	
Freshman Representative	Interface with freshmen; plan recruiting events

### *Elections*

MA elections occur at the April General Meeting. Candidates are allowed to run for up to three positions and submit a bio slide for each. Candidates speak for two minutes and answer any questions before leaving the room for another candidate or voting. Voting begins once the members have discussed the pros and cons of each candidate, at which point an anonymous vote is taken and announced. Only paid MA members are allowed to vote and once a candidate has won a position they are not allowed to receive votes for the other positions they may be running for.

In May, the current exec members meet with the future members to discuss transitions. Each current member prepares a transition document full of their duties, event ideas and suggestions for the next year, which they share with their incoming replacement.

### *Recruiting*

As was mentioned in the programming section, recruitment begins at E-Night. After that, MA officers go to freshman classrooms to get face time with potential members. From there, we host a mentorship program, where upperclassmen pair up with interested freshmen to introduce them to MatSE and MA and to serve as a point of contact for any MatSE-related questions. MA also plans specific mentor-mentee events, such as game nights, baked goods potlucks and



pumpkin carving, which serve as times for mentees to meet other freshmen and upperclassmen without the pressure of having to come to an event alone. The Freshmen Representative position, elected in October of the Fall semester from many interested freshmen, also serves as a tie between MA and the new class of freshmen.

### *Membership*

After our initial wave of recruiting, all food at events and meetings becomes available only to paid members. Membership is also incentivized through discount t-shirts throughout the year and the chance to vote at the MA elections in April. An Excel doc is used to keep track of paid members and is updated when a new member pays and emails his or her confirmation to our Treasurer.

### *Finances*

The Treasurer holds responsibility for all chapter finances. Our chapter holds a non-profit bank account, which is used to buy food, apparel and other necessities, and a registered student organization account, which is used to store university-provided finances. Our largest expenses are the MS&T conference trip and food at events. These events were funded through our EOH cotton candy sale, which generated over \$1,400 this year, bake sales and this year's MatSE pint glass sale, which generated several hundred dollars.

### *Chapter Record Keeping and Reporting*

Chapter records have been stored in a shared Google Drive folder for several years. Sub-folders containing meeting minutes, event ideas, photos from events and contact info allow for exec board access to any necessary information. Financial records are kept in a separate Google Drive, available only to the Treasurer and the President. At the end of each year, the past board's folders are archived for easy access in the coming years.

### *Publicity*

The Secretary is responsible for sending out bi-weekly email updates to all members. Our organization also informs members of upcoming events through our Facebook page, MatSE Support Group, and by sending emails through our department's server, since they can reach MatSE students who might not be on our email list.

### *Chapter Success*

One of this year's main focuses was freshmen recruitment and it was successful. MA maintained a steady attendance of around 20 freshmen members, many of whom will be taking on board positions for the 2018-2019 school year. Our chapter also sought to introduce new fundraising events, which included bake sales and a pint glass sale. These events generated hundreds of dollars for the chapter and also provided more events for members to involve themselves in. Lastly, the "Women in MatSE" group started in MA shows a successful push for the support of female engineers within MatSE at UIUC. Our hope is that these new events and strategies will be continued into next year and continue to grow and benefit the chapter.

## Letter of Support

It is my pleasure to write a letter of support on behalf of the University of Illinois Material Advantage Chapter. The incoming freshmen receive two welcome letters upon their acceptance to the Materials Science and Engineering Department—one from the department and one from our Materials Advantage Chapter—establishing the central role of MA within our undergraduate program. In my fourth year as the faculty advisor for this chapter, I continue to be impressed by the organization and degree of involvement that these undergraduates have taken upon themselves to improve their own undergraduate experiences, to prepare themselves and their peers for professional roles and to improve the department for those who follow them. I believe that the pages that follow document this level of dedication, diversity and success without need of additional accolades, but I am happy to elaborate.

The activities and contributions of the University of Illinois Materials Advantage Chapter can be divided into several categories, including: programming, service, career development, social and chapter management. I will address each individually.

*Programming:* This chapter runs a highly diverse and active program capable of engaging students throughout the program from freshman to seniors, domestic to international students and those interested in industrial and academic careers. This high level of programming not only takes a tremendous amount of work, but also great leadership and strong organizational infrastructure—both of which are key attributes of this chapter. The programming is stable, but ever adapting to the needs of the undergraduates. For example, the long standing tradition of the annual Student-Faculty Auction and a strong showing at the Engineering Open House were complemented this year by the more nascent, yet very successful mentoring program, which has dramatically increased the freshman involvement, and a joint field trip to St. Louis with the Missouri Science & Technology MA chapter.

*Service:* Service is an important component of any student organization, necessary to engage undergraduates in efforts beyond their own immediate benefit and vital to the development of well rounded team members for the professional world. The many service activities of the chapter are well documented, but I would also like to highlight their service to the department. Materials Advantage is the primary liaison between the

undergraduate population and the Materials Science and Engineering Department at the University of Illinois. This is a role that they take very seriously, providing constructive feedback about specific classes and professors as well as broader curriculum changes. Mentorship of underclassmen, through individualized relationships as well as targeted workshops around computational tools, technical writing and local research opportunities is also a concerted effort that I consider a very valuable service to the department as well. Personally, I have been able to work directly with MA leadership to identify needs of my current students and solutions to challenges that they often know about before I do!

*Career development:* The students have done a wonderful job maintaining a diverse program of career development activities for the undergraduate population and are always striving to improve this. This year, they continued resume critiques, organized numerous technical talks and the associated access to recruiters, and organized a new panel to help prepare underclassmen interested in graduate school.

*Social:* This is arguably one of the most fun aspects of the chapter that truly brings the student body together in a way that few other opportunities can. Often, the social activities are what attract new students and then get them involved in other aspects of the organization. I have been particularly impressed by the level of freshman participation this year in social activities and otherwise. As a result, several freshman successfully ran for openings in the executive board this spring.

*Chapter management:* I believe that this speaks for itself in the context of the other categories. It would not be possible to have such a high achieving chapter without excellent organization and management as I've already addressed.

I am very proud to be associated with our Materials Advantage chapter as I believe they make a tremendous impact on our department and will only continue to do so with unwavering support from our department.

Sincerely,

Jessica A. Krogstad

Assistant Professor & Material Advantage Faculty Advisor

