First-Year Engineering CoRe Experience 2018-19 Annual Report

CoRe Continues to Grow

May 15, 2019

In Fall 2018, we welcomed 1649 engineering freshmen, which is 15% more than the previous year. This represents the largest class in our history. This year’s group was also our most diverse class of undergraduate students ever admitted. We are pleased to report that the entering freshman class included a record number of 383 women, which is an increase of 23%. We thank our Theme Partners who assisted the new students and their families during the South Neighborhood move-in process in August.

Special Guest Speaker at Colloquium
The start of the new academic year had one of our alums, Rachel Hutter, Senior Vice President of International Facilities and Operations Services, Worldwide Safety and Health, and Engineering, Walt Disney World, address our incoming students. She offered advice on academic and professional success. Many thanks to Rachel for sharing her knowledge and experience with our students.

New CoRe Faculty
Last fall we welcomed our newest instructor, Jason Smith. Mr. Smith has been designated to lead the instruction of our EGR 102 Introduction to Engineering Modeling course. He is also teaching in the College’s AES program. He comes to us from MSU’s Biosystems Engineering program where he is completing his PhD. Mr. Smith is an experienced consulting engineer with a focus on bio-based renewable energy and environmental engineering projects.

Highlights of Campus Visits
We were fortunate to co-host NASA astronaut Dr. Michael Foale for a presentation on his experiences last September, have the Tenneco mobile product technology exhibit open to our students in October, and present student work on projects for Aptiv and ArcelorMittal at the College of Engineering Design Days in December and April, just to highlight a few of the many visits from our friends, sponsors, and supporters.

Recognition of Our Supporters
We held an event in October to celebrate 10 years of CoRe Experience operation, and recognized our Theme Partners, Project Sponsors, and program supporters who have helped us build the largest living-learning, first-year engineering program in the country. We were joined by representatives from ArcelorMittal, Bosch, Consumers Energy, Fanuc, Ford, Motor Company, GE, MDOT, MSU Federal Credit Union, TechSmith, Tenneco, TheraB Medical, Whirlpool, and Williams International. We could not have achieved this level of success without the dedication of all involved.

Service-Learning Projects in Central America
With a partnership formed with the MSU Residential College in the Arts and Humanities (RCAH) Program on Sustainability in Costa Rica, we successfully launched two fall semester projects for Costa Rican communities in EGR 100 Introduction to Engineering Design. One project was the design of a site plan for a new school and playground for the Girls For Success Program in Hone Creek. The other designed a new public park in the village of Shiroles. These projects were followed up with an Education Abroad experience during the Spring Break week this year where 12 students traveled to Costa Rica to help our clients implement their designs. Another project was started in spring in which an education center was designed for the sustainable coffee plantation in Life Monteverde. This project is partially funded by a joint CoRe-RCAH grant from the MSU Global Network for Civic Engagement.

CoRe Classroom and Lab Expansion
Construction has begun on creating new classrooms, labs, and student collaborative spaces on the first and second floors of Wonders Hall. The remodeled space will total nearly 30,000 square feet, and will be utilized for CoRe and College of Engineering courses. Its occupancy is planned for Spring 2020.

New CoRe Website and Video
We are excited to announce that we are working to create a new program website as well as an updated brand video. We hope to have them both in place within the next few weeks. Please stay posted!

Timothy Hinds
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College of Engineering, Michigan State University
www.egr.msu.edu/core
As it does every year, CoRe strived to provide first-year engineering students with learning opportunities that encourage their academic, professional, and personal growth and achievement. Some of our highlights are:

**2019 North American International Auto Show:**
It’s more than just cars! A trip to the Auto Show helped students to see up-close and personal how all majors are involved in the automobile industry. Students were encouraged to not only take a sneak peek at new vehicles and concept car debuts but to talk with industry representatives regarding career opportunities.

**MSU Federal Credit Union and Career Services Network Mixer:** This was a lesson on networking and professional etiquette. Students spent the night enjoying delicious hors d’oeuvres while networking with the professional team at MSU Federal Credit Union. They also learned about dinner etiquette, how to market themselves, and ways to enter and exit conversations. At the end of the event, resumes and interview tips were shared.

**Spring into Annual Enrollment:** Annual course enrollment provides an opportunity for students to review their progress and to determine their course selection for the upcoming academic year. In April, Peer Leaders and Student Ambassadors held evening walk-in sessions to assist CoRe students with course selection in preparation for their scheduled meetings with their academic advisers. Students also learned from their peers on how to enroll for summer classes, and were given updated copies of their curriculum guides.

**A Farewell to Winter Table-Top Snow Person Contest:** Take a break with CoRe! As a final goodbye to winter, CoRe hosted an indoor snow person building contest. Peer Leaders used an ice machine to create snow inside the Wilson Hall lobby! For this study break activity, each student created a table-top snow person complete with eyes, a nose, arms, and a mini scarf. Not only did students meet new peers but they also competed for the best overall snow person design.

**Haven House Community Service:** CoRe hosted fall and spring community service events. Haven House provides emergency housing and support services for families in need. In both semesters, students donated boxes of cookies and placed words of encouragement for the children at the shelter inside the boxes.

**Game Night:** A “how well do you know your MSU resources” Khoot Night! CoRe students gathered for two game nights in spring. The first game night was Khoot. Khoot is a game-based platform that allowed students to learn about career events in the College, academic advising, study skills, time management, and teamwork. They formed teams and competed in a fast-paced “do you know” competition. The second activity was a watch party for the MSU basketball team. Students interacted with popcorn, soda, and team spirit.
Bagels and Orange Juice: This was a morning of games and connecting with College and campus resources! While interacting with CoRe Peer Leaders over breakfast, students were provided with information on campus and College resources.

All CoRe Final Exams Study Night: An all-CoRe study night with snacks and peer support helped students gain access to a quiet space in Wilson Hall and prepare for their final exams.

How to Market Yourself: This was a guide on how to present a positive image to peers, faculty, and potential employers. To be successful in the job market, in class, and during faculty interactions, students were encouraged to prepare in advance. This session stressed the value of understanding what makes them unique and to be able to communicate professionally with employers, peers, and faculty members.

CoRe Block Party: CoRe hosted a “good luck on final exams” celebration that included food, games, and conversations.

Take your Child to Work Day: Student Ambassadors introduced young Spartans to engineering as a profession and handed out packages that advertised summer engineering programs in the College.

Prospective Student Tours and Presentations: CoRe Peer Leaders led tours and gave presentations to prospective students and families on CoRe program deliverables.

Pie Day Celebration: CoRe students were given pie slices in honor of Pie Day, which is celebrated on March 14 all around the world.

How to Stay Safe during Spring Break: In coordination with the social norms campaign, this event challenged myths and misperceptions surrounding drugs and alcohol usage. Students were also provided with information on how to stay safe when traveling during spring break.

How to Make the Most Out of Faculty Office Hours and Tutoring Sessions: This was an open discussion on how to prepare for faculty office hours and why they are important.

Student Probation Conference: College can be challenging and CoRe understands that sometimes students may find themselves on academic probation. Academic probation is a warning to students that their performance has fallen below what is described as “good academic standing”. CoRe and the academic advising team created a session on student success that included study tips and skills, time management skills, and campus resources. Students who attended the conference were presented with folders that included tips on how to be successful in college.

Soul Food Fridays: Food for the soul and activities connected diverse student populations with campus faculty.

CoRe At Your Door: Yes, we go directly to the students’ doors. Peer Leaders and Student Ambassadors checked in weekly on how their residents were adjusting to campus and assisted them with removing barriers that had negative impacts on their success.

CoRe is looking forward to a successful Fall 2019.
CoRe’s academic program is based on the principle that engagement in meaningful engineering experiences early in students’ undergraduate careers supports their success and persistence to graduation. Through our courses, EGR 100: Introduction to Engineering Design and EGR 102: Introduction to Engineering Modeling, we strive to engage students across the disciplines in team-based projects that pique their interests and give them a window into what professional engineering really is. Activities this year occurred on multiple fronts, from new faculty and projects in the courses to engaging with campus and community partners.

EGR 100 - Introduction to Engineering Design: This is a college-level course required of all incoming first-year engineering students. It is an integral part of the CoRe Experience. The course introduces students to the engineering profession and the engineering design process through team-based, interdisciplinary design projects, and assignments.


CoRe Industry-Sponsored Projects: These involved collaborations with Aptiv on electrical distribution system design optimization and ArcelorMittal on optimal basic oxygen furnace steelmaking scrap mix design. Teams from each of the project types displayed their prototypes on Design Day along with posters detailing their design concepts. Pre-college students recognized the most outstanding projects with awards.

Cell Phone App Inventor: Each team used MIT App Inventor to create a cell phone application to operate on an Android-based device.

Heat Exchanger Design: Each team designed a heat exchanger to take exhaust gases from the furnace vents, and cool them to a temperature that can be sampled for elevated Carbon Monoxide (CO) levels.

Arduino Circuit: Teams designed and built a circuit to light multi-colored LEDs in a unique pattern.

EGR 100 Solar Car: Teams designed, estimated, built, tested, and validated a solar vehicle with the goal of completing the solar track in the fastest time while carrying the greatest possible load in the provided trailer.

3D Printing: Teams designed and built a 3D printed cell phone case based on a Solidworks file.

“Great teaching! Thank you for a great semester!”

“Dr. Morgan is a fantastic professor!”
EGR 100 Design Day:
Sixteen teams presented their EGR 100 lab projects on Design Day Spring, 2019. Representatives from Aptiv and ArcelorMittal visited campus to participate in the day’s activities. These industry representatives, along with faculty and upperclassmen, joined in to take the time to observe the work of the EGR 100 students, give feedback, and ask questions. Participating in project design and presenting their results on Design Day is an important part of EGR 100 as a CoRe course. The award winning teams presented on 3D printing and the Costa Rica design project and were honored on Design Day.

New Project in EGR 102: Students of EGR 102 experienced a new project in spring semester, in which they used the new MATLAB Mobile program to extract raw data from their phones to create their own fitness app-style algorithms. With limited instructions provided, students were tasked with converting phone accelerometer data into step and distance estimates of a user based on that user’s personal information (height, weight, age). They then compared their own algorithms with those used in commercial apps. For extra credit, students were then tasked with generating a metric of their own choosing, using their phone’s data. Participating students were given the opportunity to present their creations in the following semester’s College of Engineering Design Day.

First-Year Women in Engineering Enrollment

Piloting New Grading Methodologies: In a partnership with Mathworks™, EGR 102 instructors and MSU IT have begun piloting an integration of Matlab Grader™ into MSU’s existing LMS. Grader™ is a virtual assessment tool which allows students to receive real-time feedback on their assignments.

CoRe wants students to know where they are going next.

“I like living near all my classes. Makes it easier to go.”

“I enjoyed it. Lots of good resources to use to help me succeed.”
New EGR 102 Student Feedback/Support System: In an effort to increase student engagement and promote long term growth, we have piloted a new post-assignment/exam reflection system. Students now conclude every assignment/exam with a brief survey asking them to reflect on the lessons learned in the assignment, the areas of improvement they may have, their strategies, and their study habits. The benefits of these exercises are two-fold. First and foremost, reflection activities have been shown in other settings to improve long-term student performance and establish the habit of critical reflection in all coursework settings. Results from these reflections have also informed instructor strategies and led to several in-class changes including modifications to presentation style, the inclusion of review videos, and the creation of a study-group sign-up.

Telling the World: In collaboration with Mathworks™, we are writing a paper describing our findings on optimal deployment strategies for Matlab Grader™ in the classroom. At issue is if Grader is best used in a traditional one-and-done student submission paradigm or in an unlimited submission paradigm, as assessed by long-term student performance. This paper has been accepted as a draft and will be presented at the ASEE 2019 National Conference.

Tutoring Services: Through the generous support of our Theme Partners and industry sponsors, we offer tutoring in calculus, chemistry, and physics to our first-year students. The CoRe Tutoring Center is a constant buzz of activity with students getting regular assistance with courses and targeted exam preparation. Due to an increasing demand, we expanded to offer tutoring in MTH 234 in spring semester. We hope to continue growing.

“The tutors were smart and knew their subjects well.”

Who Will Engineer the Future? Spartans Will.
Many Thanks for Your Support!

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  - Consumers Energy
  - Count on Us
- **Bosch**
  - Invented for life
- **Tenneco**

**Project Partners**

- **PPG**
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- **ArcelorMittal**

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CoRe students are honored at the Dean's Showcase-of-Stars breakfast.

### Academic and Co-Curricular Support Employees

- Graduate Teaching Assistants - 10
- Academic Tutors - 19
- Undergraduate Learning Assistants - 28
- Student Ambassadors - 6
- Peer Leaders - 9
- Student Media Aides - 6

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