

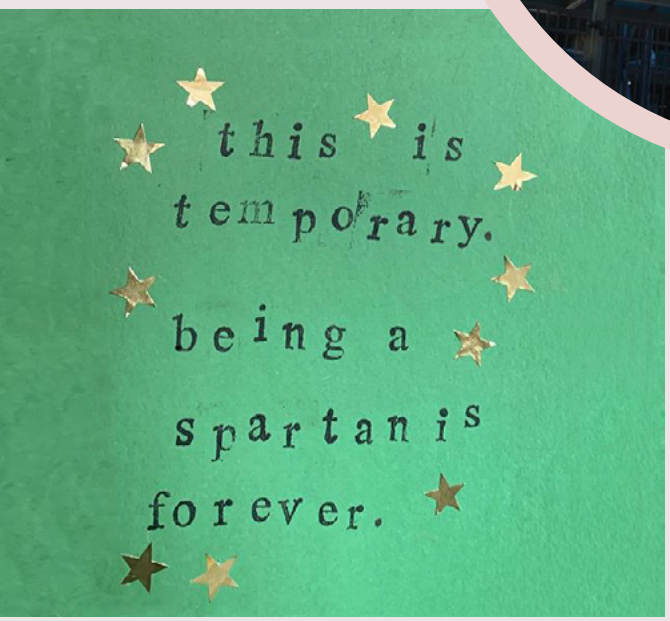














First-Year Engineering CoRe Experience

Annual Report **2019-20**

Together We Will. Spartans Will.

May 15, 2020

Another Record Class: As I look toward the end of the semester, I feel a sense of well-earned accomplishments for all that the year has involved. The incoming Fall 2019 class included a record 1706 engineering freshmen. This was 57 students more than the record of 1649 we set in 2018. The 2019 class included 353 women, 98 African Americans and 6 Alumni Distinguished and University Distinguished Scholars. Thanks go out to several of our Theme Partners who assisted these new students and their families during the South Neighborhood move-in process in August. As a college, we totaled 6283 undergraduate and 975 graduate students this year, making enrollments the largest in our history.

Colloquium Guest Speaker: We were privileged to have Dr. Asif Naseem, MSU engineering alum and President/CEO of Paragon Development Systems Inc., share his experience and vision with incoming students at our Undergraduate Engineering Colloquium. Dr. Naseem has had a tremendous career working on cutting-edge technology with industry giants such as Oracle, Motorola, Intel and AT&T. Many thanks to Dr. Naseem for sharing and interacting with our students as well as to our Theme Partners for making Colloquium a success.

New Academic Initiative: Through the strong partnership we have built with the MSU RCAH Program on Sustainability in Costa Rica, we successfully launched a 3-course sequence in Peace Engineering. The courses consist of designing solutions for Costa Rican community partners in EGR 100 Introduction to Engineering Design; learning the post-conflict reconciliation process in RCAH 202 Peacebuilding through Art, Humanities, Social Sciences and Engineering; and working



Timothy Hinds, CoRe Director

directly with communities in Costa Rica in RCAH 203 Transculturation through the Ages: Designing for Peace. We have now run four semesters of the project work in EGR 100, had three sessions of RCAH 203 and held the first offering of RCAH 202 in Spring 2020. A paper on this work was presented at the International Conference on Transformations in Engineering Education in Hyderabad, India, last January.

Education Abroad in Central America: During the 2019-20 school year and as part of the RCAH 203 course, we took two groups of students to Costa Rica to work on community-based design projects. The first occurred at the end of Fall semester when 15 MSU students assisted the sustainable coffee plantation LIFE (Low Impact For Earth) Monteverde in design of a new educational center as well as improved operations and facilities. The second MSU student group spent the 2020 Spring Break week assisting the Girls for Success program, a daily after-school initiative for indigenous girls, in updating grounds and facilities in Hone Creek.

CoRe Sounding Board: We were pleased to hold the February Sounding Board meeting in our new Wonders Hall lab facilities. Partners from ArcelorMittal, Bosch, Engineering Society of Detroit, GE, Marathon, TechSmith, Whirlpool and Williams International enjoyed discussion of recent program developments, facilities tours and dinner in the new 30,000 square foot CoRe and College of Engineering lab and classroom space.











CoRe Personnel: In August, we welcomed David Wolff as Project Labs Coordinator. David is responsible for the operation of our Wilson and Wonders Hall labs as well as other facilities within the College. He has been busy installing equipment to ready the Wonders labs for EGR 100 classes in the fall. Our personnel have also been busy sharing lessons learned through attending conferences and presenting papers at national gatherings such as the American Society for Engineering Education conference in Tampa last June and the First-Year Engineering Experience conference hosted at Penn State in July. We also developed a new brand video that can be found on the CoRe website.

New CoRe and UGS Offices: In June, we consolidated the CoRe and Engineering Undergraduate Studies (UGS) main offices into C101 Wilson Hall. This move, along with relocation of engineering academic advising, career services and education abroad offices, allows us to better serve our students by having all services housed within Wilson Hall.

Spartan Grit: In the midst of the anxiety and confusion triggered by the coronavirus pandemic, our faculty, staff, and students stepped up to the challenges we face today. Everyone has pivoted rapidly to remote teaching, learning, and work. Faculty and staff adapted to new methods to keep teaching and learning alive. Students gamely transitioned to new instructional models. I am incredibly grateful as we continue with our commitment to "building the whole engineer" - even in the midst of the pandemic.

Wishing all safe and well.

Spartans Will.

Timothy Hinds
Director, First-Year Engineering CoRe Experience
College of Engineering, Michigan State University
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Co-Curricular Highlights

CoRe would like to thank all students for making the program great through their participation and support of events that transpired during their time in the South Neighborhood 2019-2020. We completed a very active calendar of events. Students made it an amazing adventure! Now let us take a look back on all that was accomplished!

Academic Events:

Weekly Brain Breaks and Study Tables: Students expressed academic stressors and were provided with guidance from upper level student leaders. CoRe also provided a space for students to gather with their peers to complete academic assignments and to study in large groups. Snacks and academic tips were also provided.

College of Admission Presentation: Students learned about the College admission process. A CSE 231 Success Guide was also organized where the CSE Department, with the assistance of Dr. Enbody, lectured on how to master key programming concepts in CSE 231.

Scholarship and Research Presentation: Students were presented with guidelines on how to apply for undergraduate college scholarships and research positions in the College and beyond.

Smoothies and Support: The event linked students together based on their common courses. The goal was to create a peer to peer support system. A Smoothies and Mental Health event was also hosted, with collaboration with MSU Counseling & Psychiatric Services, to engage students regarding their mental health. The events were held in Wilson and Wonders Halls.





CoRe Red: This was a welcome event for the women in CoRe, which included introductions to CoRe faculty, staff, and academic advisors. Campus resources and study skills packages were handed out. There were also games and planned peer to peer interactions.

Final Exam Fair: Students visited tables that assisted with how to prepare for exams. This was a neighborhood collaboration. Students from the entire neighborhood attended this event.

Welcome to Spring Bash: CoRe hosted a welcome back from winter break event. Students were able to play games and gather information on College, campus and neighborhood resources. Everyone was a winner!

Social Events:

Undergraduate Engineering Colloquium: Incoming first-year engineering students were welcomed, as in every year, by the College of Engineering. A series of events were hosted during move-in weekend to assist students in adjusting to campus and meeting their peers.

Community Service: Students created messages of support for children in a local shelter. They also decorated and donated cookies.

Football Watch Parties: During football Sundays with CoRe, students gathered and cheered for their favorite NFL teams.

Origami Night: International students gathered with domestic students to break down barriers and build relationships. CoRe students also built social connections through planned interactions on the residential floors.

Weekly Study Breaks: Study Break activities included pumpkin painting, cookie nights, game nights, and smoothie nights. The purpose was to help students understand the value of mental breaks in between long study periods. Handouts were distributed on the downside of cramming and how it does not lead to retention of information.

Popcorn Tuesdays: Popcorn and handouts were provided on mental health, study skills, time management, stress management, neighborhood resources, add and drop class deadlines. This was accompanied by a final exam send-off.



Rounds: Student staff would visit students door to door to ensure that they were attending classes and were adjusting to MSU. During weekly staff meetings if staff learned that a student was struggling, the CoRe Co-Curricular Director would follow up with the student(s) directly to assist.

Professional Events:

Careers: A professional interactive presentation was held on how to navigate a career fair. There was also a Consumers Energy Mock Career Fair with real professional opportunities with the company.

College Majors Night: This was an Expo where students were greeted by upper level students in there major. Students learned about degree requirements and the experiences their peers had with internships and co-ops. This event also discussed the importance of faculty office hours.

Scholarship & Internship Writing Assistance: A drop in session for personal assistance with completing applications to apply for research, scholarships, and other professional opportunities was offered.

In the midst of challenges, we emerged stronger!
As students departed MSU during the Spring 2020 semester in anticipation of completing the remainder of their semester under quarantine, plans and daily routines were altered due to unforeseen challenges associated with the pandemic. In the face of the challenge, we strengthened our resolve, our compassion, and commitment to stay focused and stand tall.

We are Spartans and Spartans Will!









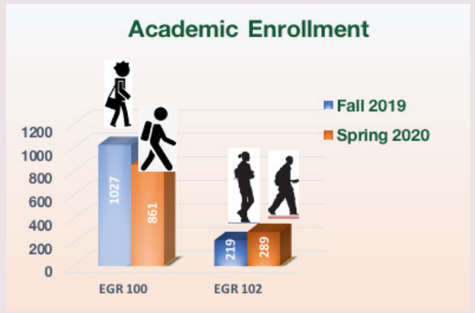


Academic Highlights

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 focused on engaging with campus and community partners.

EGR 100: An important part of the CoRe Experience is the academic program. EGR 100, Introduction to Engineering Design, is a required course for all incoming first-year engineering students. These students are introduced to the engineering profession and the engineering design process through team-based, interdisciplinary design projects and report writing.

EGR 100 Paper Presented at ASEE: A self-reporting measure of team performance was given to first-year engineering students to examine their ability to effectively interact with their team members. The effectiveness of their team experiences was evaluated using a comparison of the students' responses to two surveys completed before and after their team projects in EGR 100. This analysis was performed to examine how to improve team interactions for students who find working in a team to be a difficult experience. The effectiveness of the course material on team interactions was evaluated in EGR 100 and the results of this study were presented at the June 2019 ASEE Annual Conference in a paper titled "Improving Team Performance in First-Year Engineering Students".



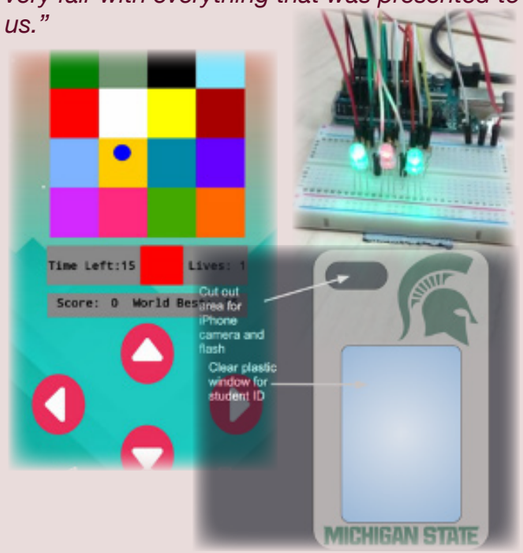
EGR 100 Projects and Sponsored Projects: Lab projects in EGR 100 involve a choice of seven projects. These projects are the solar car competition, cell phone application inventor, designing a heat exchanger, 3D printing Solidworks design of a cell phone case, Arduino LED programming, Costa Rica design of a School Site and Educational Facility and Environmental Educational Model Design, and a collaboration on an oxygen furnace steelmaking design. CoRe continued successful partnerships with the Residential College in the Arts and Humanities (RCAH) on the Costa Rica design projects, and ArcelorMittal as an industry sponsor of the optimal basic oxygen furnace steelmaking scrap mix design. Select teams from each project presented their designs and posters at Design Day in the fall semester of 2019.

"Dr. Morgan is always willing to help and encourages students to do their best."



Spring 2020 Transitional Modes of EGR 100: An effort was made in EGR 100 to make sure that students in the course were receiving the same challenging academic experience online as was found in the course before the face-to-face course meetings were ended at MSU. The laboratory sessions continued to meet online, and all projects, except the solar car project, continued for the students. This meant that the students could still be exposed to technical design projects despite the changes in the course. Online projects were completed using applicable software applications throughout the design process. Lectures, office hours, open labs for design assistance, and lecture assignments were all converted into an online format to allow students around the globe to work together as they completed the academic requirements of the course.

"With Dr. Morgan, lecture was never dull. I enjoyed hearing what she had to say, and she was very fair with everything that was presented to us."







"I think Dr. Morgan is an amazing professor; even throughout this COVID-19 pandemic, I find that the lecture videos that are posted are just as helpful as, if not more so than, the in person lectures we were having before."

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 and MTH 235 in fall and spring semester.

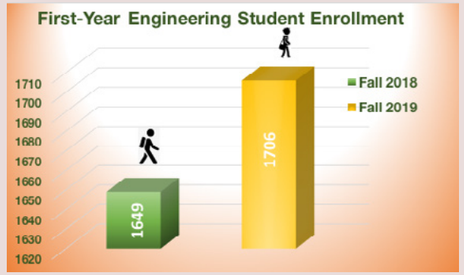
"Tutors allowed students to attempt the problems on their own and went over the entire process afterwards."

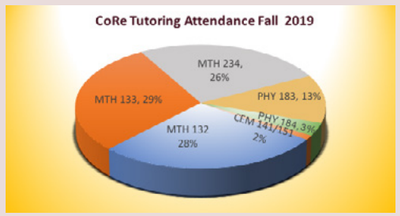
The sudden pandemic did not change our commitments to offer continued tutoring services to our students - it strengthened them. Our student tutors instantly transitioned to virtual tutoring, employing various resources like physical whiteboards, personal tablets, and the whiteboard option in zoom to offer regular evening tutoring sessions. We hope to continue growing.

"Tutors are engineers and can explain things better."

EGR 102 - New Projects: Students

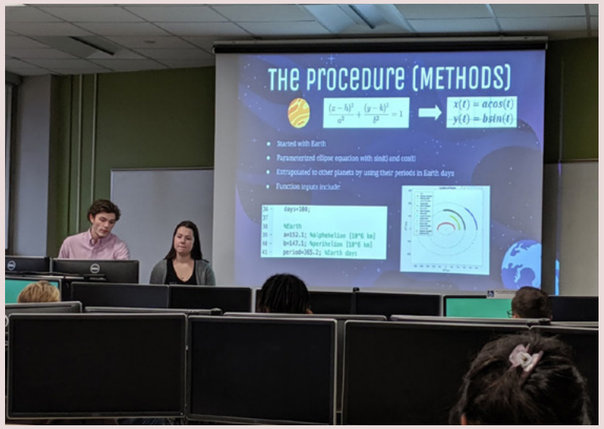
of EGR 102 experienced a final project in which they used the new MATLAB Mobile program to extract raw data from their phones to create their own fitness app style algorithms. Students, with limited instruction, were tasked with converting phone accelerometer data into step and distance estimates of a user based on that user's personal information (height, weight, age). Students then compared their own algorithms to 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.





New testing methodologies: In 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 work. In spring semester Grader has been used as a way of delivering weekly quizzes and periodic exams. Grader has also been an important tool for us in our transition to an online model in the face of the pandemic.

"Mr. Smith is an amazing professor and does his best to keep the lecture hall lively and interesting. I greatly appreciate his attitude on Friday mornings and couldn't ask for a better approach to the class."



Transition of EGR 102 to Online Teaching: EGR 102 has made the transition to online content delivery relatively smoothly. All instruction was moved into the format of pre-recorded videos launched at regular periods throughout the week. Online office hours were extended into the evenings so that students in all time zones could easily participate in class Q&A periods. Other assignments, quizzes, and readings had already been conducted in an online format, so no changes were necessary.

"Thank you for making the transition online so easy. This class was well done."

EGR 891 - Technical Writing for Engineers and Scientists: Another initiative of CoRe was the development and delivery of training programs and program materials for graduate students on teaching and assessing technial writing in College undergraduate courses. Delivery of these materials was through EGR 891, which was taught both in spring and fall semesters. It was well received by students.

"EGR 891 exceeded my expectations and I really learned a lot."

"The instructor Ms. Sarkar was very knowledgeable. I feel as if my skills in technical communication have improved twofold after taking this course."

While our focus on student safety, student engagement and success will remain, we will continue our mission to help first-year engineering students succeed. *Spartans Will.*







Theme Partners

Project Partners

Academic and Co-Curricular Support Employees



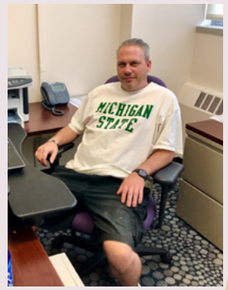
Graduate Teaching Assistants - 12
Academic Tutors - 20
Undergraduate Learning Assistants - 25
Student Ambassadors - 9
Peer Leaders - 13
Logistics Coordinators - 4
Student Media Aides - 6
Project Assistants - 2
Lab Assistants - 1



CoRe Director
Tim Hinds



CoRe Co-curricular Director
Carmellia Davis-King



Project Labs Coordinator
David Wolff



CoRe Support Staff
Aimee Reynolds



Teaching Specialist
Jenahvive Morgan



Teaching Specialist
Debjani Sarkar



Teaching Specialist
Jason Smith

WHO WILL ENGINEER TOMORROW? **SPARTANS WILL.**

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