National Academy of Engineering Grand Challenges Scholars Program Operational Document

MONTGOMERY COLLEGE

Science, Engineering & Technology

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Vision and Goals

Montgomery College's mission states that "We empower our students to change their lives, and we enrich the life of our community. We are accountable for our results." Following on this mission statement, the College has put forward the following vision: "With a sense of urgency for the future, Montgomery College will be a national model of educational excellence, opportunity, and student success. Our organization will be characterized by agility and relevance as it meets the dynamic challenges facing our students and community."

The particular goals and vision of the Science, Engineering, and Technology area, especially as it seeks to join the National Academy of Engineering's Grand Challenges Scholars program, include providing a STEM Honors program for our students, creating a cross-disciplinary atmosphere, and preparing students who transfer to a Grand Challenges participating four-year institution for full engagement with the Grand Challenges program once they transfer.

We see our goals and vision aligning with the College's mission and vision in these ways:

1. Providing a STEM Honors program for our students. Like other Honors programs at the College, the STEM Honors program is aimed at motivated students seeking academically rewarding experiences, including honors courses, seminars, independent study, internships, service-learning opportunities, and social and cultural activities. This aim aligns well with Montgomery College's vision of being a "national model of educational excellence, opportunity, and student success." Our STEM Honors students will continue to demonstrate such excellence as they continue their education and careers.

2. Creating a cross-disciplinary atmosphere. The Engineering Department seeks students and faculty from non-engineering disciplines to provide multiple viewpoints, particularly on the social and environmental dimensions of the Grand Challenges. We seek to emphasize cross-disciplinary connections and to offer a course that would include faculty members from multiple disciplines. This aim aligns well with Montgomery College's vision of characterizing "agility and relevance as it meets the dynamic challenges facing our students and community." The Grand Challenges are dynamic, they demand our best efforts, and they require the agility that a cross-disciplinary atmosphere could offer. Of course, this aim also aligns with the College's mission to "enrich the life of our community."

3. Preparing students who transfer to a Grand Challenges participating four-year institution for full engagement with the Grand Challenges program once they transfer. Montgomery College's Engineering program is the largest among all community colleges nationwide. Most of our undergraduate engineering courses are transferable to top tier four-year institutions. Students in these courses have numerous academic enhancement opportunities through clubs, internships, and undergraduate research. These courses and opportunities prepare students well for transferring, and our alumni attend MIT, Georgia Tech, the Clark School of Engineering at the University of Maryland, and many other prestigious institutions. In this regard, we surely fulfill Montgomery College's mission to "empower students to change their lives."

Steering Committee

The GCSP Steering Committee will consist of the following members:

- Permanent Members:
  - The Dean of Science, Engineering, and Technology
  - The Director of the GCSP
- Faculty Members:
  - One full-time faculty member from the Engineering department
  - One full-time faculty member from a cross-disciplinary department (ideally one with links to one or more of the cultural, business, social consciousness, or multidisciplinary competencies; in any event, not from Science, Engineering, and Technology
- One student; a past or current member of the MC GCSP.

Permanent Members remain on the Steering Committee while they hold the position that gives them a seat.

Faculty Members serve a two-year term. The term length is a tradeoff between allowing regular turnover and the influx of new energy and new ideas while also allowing members sufficient time in their position to fully learn the issues and functionality of the GCSP.

Student Members serve a one-year term and provide the perspective of participating students. The brevity of the term reflects the fact that most GCSP students will be participants for about one year; an extension to a second year is possible for an active student member who remains a student at MC or transfers to a nearby participating GCSP four-year institution and is willing to serve a year after graduating.

The responsibilities of the Steering Committee are as follows:

- Review of applicants and selection of program participants
- Assessment of student program completion
- Review of petitions for exception to the GCSP Components guidelines
  - Inclusion of new activities
  - Exceptions to the rule that activities may only be considered for fulfilling a single component
  - Coursework completion of the multidisciplinary component
  - International Student petitions describing local (non-travel) activities intended to complete the multicultural component
- Advising upon evolution of the GCSP at MC to respond to changing future circumstances

To fulfill these responsibilities, the Steering Committee will meet at least twice times a year:

- middle or late February to review applicants and select new scholars for admission to the program
- early April to assess student program completion and review petitions for exceptions to the component guidelines

In addition, Steering Committee members should act as ambassadors for the GCSP by attending the three yearly meetings. For example, they may make presentations at targeted non-engineering classes to aid recruitment.

Recruiting

Within the Department of Engineering, Physical, and Computer Sciences, recruitment will be based upon the following:

- Participation in familiarization activities the department holds early in the fall semester, publicizing clubs, competitions, and other extra-academic activities like EWB, Drone Club, NASA Swarmathon Competition, etc.
- Word of mouth, Scholarship and Honors bulletin boards in the Engineering department hallways, and other passive recruitment methods.
- Publicity as an Honors Program at MC, joining the current four Montgomery College Honors Programs (Montgomery Scholars, the Scholars Circle, Macklin Business Institute, and Renaissance Scholars).
- Brief directed presentations at start-of-semester organizational meetings for especially relevant groups like EWB, Study Abroad, and other groups not yet identified, especially within the business and cultural competency spheres. The Macklin Business Institute Honors Program, for example, may have some activities that suit the GCSP focus, or may be interested in hosting a presentation to explore cross-disciplinary synergies.

To recruit students from other (non-engineering) disciplines will require outreach and identifying likely populations of interested students. The initial effort will be focused on clubs, classes, and extra-curricular activities that are naturally cross-disciplinary or that are enhanced by exposure to engineering issues and problems. Short presentations to those activities and classes, and to the faculty from non-engineering disciplines who support the activities and teach the classes, will aid recruiting not only of GCSP scholar applicants, but also of cross-disciplinary faculty mentors.

For example, classes like ANTH 256 (World Cultures) might have students interested in a more detailed focus on modernization (solving current problems with engineering) and globalization of their culture area/geographic region, and a short presentation of GCSP could recruit interested students. ARCH 203 (Principles of Sustainability), GHUM 101 (Intro to Global Humanities), MGMT 210 (Entrepreneurial Opportunity Analysis and Decision-Making in Technology Ventures), SOCY 250 (Globalization Issues) all have the potential for significant overlap (shared goals and interests) that might reward recruitment efforts focused on those classes. While the wide variety of language and history courses do not have any individual courses that have a major overlap with GCSP goals and objectives, those programs include and support efforts like the Study Abroad program and a variety of cultural awareness activities on campus that might be fertile grounds for recruiting non-Engineering GCSP students.

In the long run (after the program is well established) a combination of word-of-mouth, acceptance within the existing (well-publicized) Honors Programs at MC, and regular outreach and recruitment presentations at classes and events as mentioned (focused on the ones with a greater return on invested energy) should enable MC to support a program meeting or exceeding the stated goal of producing 20 or so GCSP students per year. Focused outreach to non-engineering disciplines (informed by the research mentioned above and consulting with faculty and administrators in those areas) will ensure that a significant fraction of the GCSP students are from other disciplines.

In the short run (to get the initial program up and running) it will be necessary to put more time and energy into the program for the first year or two. A strong start could be ensured by having a high-publicity event supported by NAE, with Dr. Mote or Dr. Ramakrishna or some other notable speaker(s) as a kick-off event. The November 2017 talk by Dr. Mote at MC created significant interest and nearly 100 students attended; with advanced publicity and outreach to non-engineering disciplines it should be possible to triple that attendance and generate significant buzz and word-of-mouth that can be converted into starting momentum on the MC GCSP Honors Program. The SET Dean's Office will organize and support this kick-off event.

As with all community colleges, MC serves a significant population of non-traditional students (students reentering college after some time in the workplace, single parents, students switching careers, transfer students, and students intending transfer). To serve all these students, the GCSP at MC must plan to recruit, include, and support them. Recruiting non-traditional students will be achieved by reaching out directly through email and other media, as such students tend to be less tightly connected to other students socially (reducing the impact of word-of-mouth) and more likely to focus on night classes (reducing the chance they will attend or hear of daytime activities like the planned two high-profile GCSP events per year). One of the strengths of Montgomery College is its diversity; MC is the most racially and ethnically diverse community college in the continental United States (Chronicle of Higher Education, August 19, 2018). Recruiting a diverse cohort within the GCSP is a critical goal. These students from disparate backgrounds bring a wide variety of perspectives and insights, so recruiting and supporting such students is a priority.

MC has a very high proportion of international students for a community college, both overall (9.3%) and within the engineering program (36.7%). International students in engineering at MC already embody the global interconnections that motivate the multiculturalism competency within the GCSP. They already have a global perspective, and are working to become engineers working on global problems. Their unique multinational perspectives will help create a strong cohort of participating students, so the MC GCSP will work to identify and recruit strong candidates from their international student base by making presentations to that community.

Application and Selection

Standards for the GCSP will be set to match those of the existing four Montgomery College Honors Programs:

- Completion of at least 12 MC credits with a GPA of 3.2 or higher in transfer-level classes, including ENGL 101 or ENGL 101A with a grade of A or B
- SAT scores of 600 on each section and a minimum high school GPA of 3.5, unweighted
- Eligibility for ENGL 102, as determined by the MC placement process, and a minimum high school GPA of 3.5, unweighted

The logistics of registration and the two-year attendance span of students carrying a full load of classes requires that we be able to select students before the middle of the spring semester of their freshman year. This allows them to have time to accept membership in the GCSP, meet with GCSP faculty advisors to plan their classes for their second year, and have an academic plan in place when registration opens for

the fall semester, which happens around the third week of April. The tentative timing of the normal schedule for students would be this:

- September (start of fall semester): Kickoff Meeting to start the GCSP program for participants, with publicity/recruitment benefits for the program overall.
- Early February (two weeks after the start of the spring semester): applications for GCSP are due.
- March 1: applicants are selected.
- March 15: New Scholar Orientation Meeting. Students are partnered with mentors and made aware of resources, expectations, and responsibilities.
- Late March and early April: applicants meet with Mentors and develop an academic plan to complete program objectives
- Mid/late April: Spring Sendoff Meeting, focused on our GCSP scholars who are leaving and transferring to four-year institutions, motivating and energizing them to continue on as they go to another school. Honors presentations and a notable guest speaker.
- Late April: registration opens for the fall semester; newly recruited GCSP scholars register for classes for fall based upon their academic plan developed in consultation with GCSP mentors.

The above schedule creates overlap between successive cohorts. A newly-arrived freshman will hear about the GCSP through multiple pathways, will be exposed to public parts of the GCSP Kickoff Meeting (guest speakers and seminars, for example), as well as other recruitment efforts (Club Rush, departmental mailings, and synergies with partnered or associated programs such as Study Abroad, Engineers Without Borders, Raptor Tank, NASA Swarmathon competition). In the spring semester interested students apply and are selected, receive orientation as new scholars and are partnered with their mentors, have time to develop an academic plan that integrates their major with fulfilling GCSP goals and objectives, register for classes, and participate (as new GCSP scholars) in the Spring Sendoff Meeting activities. The following fall they are welcomed as the focus of the GCSP Kickoff Meeting, achieve their program goals, and are honored for their success as experienced GCSP scholars at the Spring Sendoff Meeting.

For participants to have sufficient time to complete their programs, applicants must either be first-year students or otherwise students with at least one year remaining in their studies at Montgomery College before transfer. Non-traditional students are welcome.

Applications must include a current transcript showing academic ability at Honors standards as described, and an essay describing why the student wishes to participate in the GCSP and choosing one of the 14 Grand Challenges as a thematic focus for their participation in the program. Their choice of Grand Challenge Problem will direct and inform their activities in the GCSP. Both academic merit and personal motivation are critical to program success, and the Steering Committee will judge applicants on both components when deciding upon admittance into the program.

Program Completion and Student Transfer

To successfully complete the program as a Grand Challenges Scholar at Montgomery College, a student must fulfill the following criteria.

- Have a Grand Challenge Problem to provide a framework and context for their participation and activities in the GCSP.

- Complete the GCSP Honors Course in Engineering Consequences and Ethics. This is a general requirement of the program and does not also count as fulfilling any of the five competencies.
- Successfully complete activities in two of the five competencies, connected to their chosen theme (Grand Challenge Problem). Appropriate activities that count for completion of the program objectives are described below under GCSP Components.
- Maintain good standing as an MC Honors Student.
- Complete an e-portfolio documenting their activities and GCSP experiences.
- Complete a reflection summarizing their experiences in the GCSP program and its impact on them. Selected students may be asked to give a short presentation on their reflection at the Spring Sendoff meeting of their final semester.

Upon completion, Montgomery College Grand Challenges Scholars will have the opportunity to transfer to a four-year college that has a Grand Challenges Scholars Program of its own. Transfer to such an institution will allow them to continue and enhance their GCSP experience as Grand Challenges Scholars in their receiving institution.

Memoranda of Understanding (MOU) establishing consistent pathways for MC students to continue as GC Scholars in receiving institutions are critical to the success of a GCSP in any two-year institution. Three of our normal Engineering transfer partners are University of Maryland (College Park), University of Maryland Baltimore County, and Georgia Tech; all three of those schools have Grand Challenges Scholars Programs in place. We have very close partnerships with UMBC and UMCP; we are in the process of creating MOUs with both in-state partner institutions and we do not foresee any problems in setting them up. Georgia Tech represents a much smaller fraction of our outgoing transfer students; we intend to discuss MOUs with them once we have relationships with UMCP and UMBC formalized. Another institution that receives a large number of our Engineering transfer students is George Washington University; GW does not have a GCSP at this time.

Faculty Mentors

To be a successful Grand Challenges Scholar, a student must have a multi-disciplinary perspective.

All GCSP students will have a mentor within their major (a “major mentor”) and a cross-discipline mentor. Major mentors are responsible for ensuring that the student is supported and integrated within their field of study, are on track for completing the requirements for their major, and have an appropriate academic plan for transfer.

Cross-discipline mentors have the responsibility of giving additional perspective and viewpoint to the student by informing them of how their coursework, academic plan, options for transfer institutions, and other choices might have an impact beyond that of their major. Assistance in finding a cross-discipline mentor will be provided at the New Scholar Orientation Meeting.

Engineering majors should choose their cross-discipline mentor appropriately to support their chosen Grand Challenge problem.

Students with majors in other disciplines should have an engineering mentor as their cross-discipline mentor. Their major mentor will ensure that their academic plan within their major is on track; the

engineering mentor will provide the engineering context that will aid their understanding of the issues surrounding their area of focus (the Grand Challenge they wish to work on), and advise them on what courses in the engineering curriculum might be useful to their program success.

This two-part mentoring plan answers the observation that the academic faculty serving as mentors are often poorly informed about other disciplines even within the same institution. This will give student participants a much more nuanced and varied perspective, allowing them to make better choices in their future education and post-graduate options. Every student will have guidance within their major (towards getting their degree and transferring to continue their studies effectively and in a timely fashion); every student will have both an engineering perspective and a non-engineering perspective on their area of focus.

The GCSP program will maintain a list of participating faculty members willing and capable of acting as mentors. Acquiring and orienting informed and enthusiastic mentors willing to act as cross-discipline majors will be a priority during the initial setup of the GCSP. Some disciplines (business, for example) might buy in to the GCSP more heavily than others; it will be important to be responsive to changes in program demographics within non-engineering disciplines to ensure sufficient mentorship support. Every GCSP scholar (regardless of discipline) will have contact with one engineering mentor, so the demand for mentorship within the engineering department will remain fairly constant.

To build gradually toward a respected GCSP, and to have time to create the mentorship support structure in a consistent, effective, and timely way, the MC GCSP will accept only around 5 student applications the first year. The second year the GCSP will accept 10-15 applications. By the third year the pool of faculty mentors should be well established and other program-start challenges should be well resolved, so the program will have no artificial limits upon participation from then on. This gradual build will also allow us to estimate mentorship workload more realistically and accurately, and respond appropriately when granting faculty financial support or course release for mentorship activities going forward.

Mentors must meet with students at least once a semester. A student's initial meeting after acceptance into the program will be at or soon after the New Scholar Orientation Meeting. Initial meetings are focused upon ensuring that students are aware of their options and responsibilities with respect to fulfilling the GCSP competencies, and developing an academic plan that fits with their major but allows them to complete the GCSP successfully. After the initial meeting, students will meet with their mentors at the beginning of each semester to check in, ensure everything is proceeding well, and deal with any challenges that have arisen.

New faculty mentors will undergo their own orientation and training. Training material will be created to ensure mentors are prepared appropriately and understand their responsibilities. The MC Engineering Department has a very active advising system with all students preparing academic plans; we will use that model and those existing resources, supplemented by additional material to communicate the GCSP specific responsibilities. Funding will be allocated to create this training material, and to evolve it as the program grows.

Funding/Support

The MC GCSP will need to support a variety of activities, many of which have institutional support already established that will be employed to support GCSP activities. Examples include the Study

Abroad program for students and EAP (Employee Assistance Program) funds for faculty that can be used to support faculty participation in Study Abroad. EAP funding also supports travel expenses for faculty to attend the GCSP annual event and conferences.

Specific funding needs for the Montgomery College GCSP will include:

- Travel expenses for a few students to attend the annual GCSP event each year.
- Course release for the GCSP Director.
- Course release for faculty developing program policies, mentor training materials, promotional materials, flyers, and similar documents. This funding will be a one-time need only, as maintaining such materials and updating them will be much easier once they are created initially.
- Course release for GCSP Mentorship appropriate to the number of students supported
- Regular guest speaker travel expenses and honoraria. We envision inviting one speaker a year, near the end of the spring semester.
- A kickoff event at the start of the fall semester.
- A sendoff event with a guest speaker near the end of the spring semester.
- Funds to enable scholars to participate in varied activities (service learning experiences, research, conferences, and competitions) to enhance their GCSP experience.

Many of the above funding needs will be supported by the office of the Dean of SET; some events that redound upon Montgomery College as an institution (like honoraria and travel expenses for guest speakers) may be funded at a higher level.

Yearly Events

Three events each academic year will support the GCSP at Montgomery College; the Fall Semester Kickoff, New Scholar Orientation, and Spring Semester Sendoff events.

Fall Semester Kickoff

This event welcomes scholars to the new academic year. It ensures that new scholars are quickly welcomed and given a sense of community. Additional goals are to publicize the program for purposes of advertising and recruitment.

Fall Semester Kickoff will be the first week of September.

New Scholar Orientation

New participants in the program need to be informed on how the program works, what their responsibilities are, and the variety of resources they have available to them. They will meet their mentors within their major of study and choose their cross-disciplinary mentor. All mentors in the program will introduce themselves to the new scholars and scholars will be assisted in connecting to a cross-disciplinary mentor appropriate to their chosen Grand Challenge problem.

New Scholar Orientation will happen around March 15. It will be a private event open to new Grand Challenges Scholars.

Spring Semester Sendoff

This event is intended to provide the capstone for the experience of GCSP scholars at MC. Scholars will be publically honored for their achievements; students who are going on to GCSP programs at four year institutions will be recognized. There will be presentations and a notable external speaker.

Spring Semester Sendoff will be late in April and as late as possible without interfering with Final Exams.

Unique Aspects

Montgomery College has a variety of resources available that will enhance our GC Scholars Program, providing multiple pathways for achieving GCSP Components.

- Montgomery College has a very active chapter of Engineers Without Borders (EWB), who will be a strong partner with the Grand Challenges Scholars Program moving forward. Participation in EWB may match several of the competency areas described below under GCSP Components.
- Montgomery College has an active Study Abroad program and a high percentage of international students, both of which provide multiple opportunities for achieving the multicultural competency.
- Montgomery College has a wide variety of internship partnerships, including Montgomery County Government (where the CyberCorps Scholarship for Service has sent Cybersecurity interns for several years) and research internships at NIST, all of which provide ways to achieve the research or service competencies.

GCSP Components

Grand Challenges Scholars must fulfill at least two of the five competencies of the GCSP program:

- Research Competency
- Multidisciplinary Competency
- Entrepreneurship Competency
- Multicultural Competency
- Service Competency

For each competency there are a number of curricular and extra-curricular activities that serve to demonstrate success in that competency. Established activities that count for success in a competency are listed below. In addition, students who participate in an activity not listed may petition for its inclusion. The Steering Committee will review any such petition; the general rule is that an activity must represent at least three credit hours (or equivalent semester-long effort to a three credit course) to be considered.

All activities require students to submit a mini-proposal describing how the activity will relate to their selected Grand Challenge, satisfy the learning objectives for one particular competency, and how it will meet the goals and requirements of the GCSProgram. Upon completion of each activity, students must submit a comprehensive reflection about the experience and add it to their e-portfolio.

No experience may be counted towards more than one category. Students may petition the Steering Committee for an exception if they can demonstrate:

- That the activity has major components supporting more than one competency. For example, a two-week stint working with Engineers Without Borders in Panama building a school with electricity (solar-powered) in an isolated area could easily fulfill the Service Competency, the Multicultural Competency (exposure to a very different set of cultural and social perspectives), or the Multidisciplinary Competency (a wide variety of different problems must be overcome for success, many of which are not solely engineering problems).
- That the major components examined represent significantly more than three credit hours each. For example, the EWB case discussed above would include a lot of design and preparation time before the trip, probably up to a full semester's worth, then all the work on the trip itself, and could represent far more than the equivalent of two 3-credit courses.

If the petition is allowed, each competency within that activity must have its own mini-proposal before the activity and its own reflection afterwards, focused on the competency in question.

To count for success, each activity must be related to the student's chosen Grand Challenge focus. Established activities that count for demonstrating success in a competency include:

Research Competency

- Summer-long research program (REU, fellowship, or industry research internship)
- Completion of a semester-long internship focused upon an approved GC-related topic (at NIST, Montgomery County Government, CyberCorps Scholarship For Service cybersecurity internship, or one of Montgomery College's other industry partners)
- Major contributor to a GC-related competition (NASA Swarmathon, for example)
- Appropriate coursework – an independent study or other research opportunity with faculty oversight on a GC-related topic of similar extent to the above

Multidisciplinary Competency

- Completion of a multidisciplinary internship
- Completion of CMSC 140 or ENES 100 (for Grand Challenges Scholars from non-Engineering, non-Computer Science disciplines)
- Completion of ISTD 140 (Discovering New Ventures – Foundations of Entrepreneurship) for Grand Challenges Scholars from Engineering or Computer Science disciplines.
- Completion of an appropriate 3-credit course in another discipline (outside the student's major) directly related to their chosen Grand Challenge topic. Such course choices must be submitted to and approved by the Steering Committee in advance.

Entrepreneurship Competency

- Founding or significant contributions to the launch phase of a startup company, new organization, or significant campus initiative.
- Participation in an entrepreneurship competition (Raptor Tank Business Pitch Competition, for example).
- Completion of an entrepreneurship-related internship in the student's GC focus area.
- Completion of a project-based entrepreneurship course (ISTD 210 / MGMT 210).

Multicultural Competency

- Participation in an Engineers Without Borders travel team.
- Continuous, significant involvement with major contributions to an Engineers Without Borders project team, without travel.
- Completion of a significant internship with a global or international focus.
- Completion of a semester-long or summer-long study abroad experience.
- Completion of two or more shorter Study Abroad experiences.
- For international students the multicultural competency can be satisfied by crafting an experience locally (without travel) that informs and expands their understanding of differences between US culture and their home culture with a bearing upon their chosen Grand Challenge focus topic. Such an experience should be designed with the help of their mentor and must be submitted and approved by the Steering Committee. Like all competency activities, students must submit a comprehensive reflection about the experience and add it to their e-portfolio.

Service Competency

- Participation on an Engineers Without Borders travel team.
- Continuous, significant involvement with major contributions to an Engineers Without Borders project team, without travel.
- Significant multi-semester outreach or community service
- Completion of a public-service related internship
- Substantial, sustained volunteer work with an organization related to the student's Grand Challenge.

Recognition

As an official part of the Montgomery College Honors Program, all Grand Challenges Scholars in good standing will receive the notation "M.C. Honors Program" on their academic transcripts, and their names will be announced as "Honors Program" when their degrees are presented at commencement.

There will be a Spring Sendoff Event in the middle of April focused on our GCSP scholars who have completed their programs. Students who are transferring to a GCSP at a receiving institution will be recognized. Selected students will give presentations on their GCSP experiences. There will be Honors presentations to all successful students, recognition from the Dean of SET, and a notable guest speaker.

Seminar Course on Engineering Consequences and Ethics

MC will develop a short (one credit) seminar and discussion course at the 200 level focused on Engineering Consequences and Ethics. MC's current engineering curriculum is focused on pure engineering content; as such we do not have any courses that specifically put engineering projects into the

broader context of their larger environment – culture, society, long-term impact. This course will fill that gap, allowing honors-level discussion of issues of engineering ethics and responsibilities, examining case studies of engineering projects where inadequate understanding of local culture or complexities created unforeseen consequences that had a major impact upon the success of the project. To enhance the multi-disciplinary approach of this course, we envision it being team-taught with non-engineering discipline faculty. Depending upon the course material (not yet developed) faculty from the Philosophy (Ethics), Business, or Languages departments (focused upon multicultural experiences, not language per se) may be included. English 102 will be a prerequisite; no math prerequisite.

This course will be required of all Grand Challenges Scholars. As a one-credit course we will have the flexibility to offer it across the compressed winter session, or in summer session I, as well as during the normal spring semester. That scheduling flexibility may be necessary, as the degree plans for the various engineering degrees MC supports are already highly determined.