Curriculum Review Committee
Final Report

January 13, 2016

UNIVERSITY *of* ROCHESTER

Contents

Curriculum Review Committee Final Report

Executive Summary

During the fall 2014 semester, Deans Lennie and Feldman appointed a Curriculum Review Committee, with John Jaenike as chair and 15 faculty, staff, and students as members of the Committee. The Committee met regularly for the following year. Summarized below are its key findings and recommendations.

The Committee strongly endorses the fundamental principles of the Rochester Curriculum, which it believes provides a framework in which students identify and pursue their core interests while being enabled to explore additional academic areas. The Rochester Curriculum is founded on three principles: freedom, passion, and discipline. Students have the freedom to select areas of study that interest them, the ability to pursue these interests with passion, and requires of them the discipline to design their course of study. The Committee recognizes that there is a potential trade-off between freedom and breadth of knowledge as encouraged by a core curriculum. However, it concludes that the benefits of the current structure clearly outweigh the costs.

The Committee made a total of 33 recommendations in 5 general areas. These recommendations include

General Education

- Permit students to complete up to two bonus clusters. These are clusters completed by a student beyond those used to meet the distributional requirements and will be listed on the transcript. This category would include a second cluster taken by Engineering students, as they are required to take only one cluster either in humanities or social sciences. Recognition of bonus clusters encourages students to explore new areas and pursue them in some depth.

- Every introductory-level course should be included in a cluster, so that any course a freshman takes (other than those associated with the primary writing requirement) could be used for a major or a cluster. This would enable students to explore various areas of interest without having to worry about satisfying general education requirements.

Writing

- The Writing, Speaking, and Argument Program has collaborated with several departments in the Hajim School and with some departments in the School of Arts & Sciences in the development of discipline-specific upper-level writing courses. Expand the involvement of the Writing Program in upper-level writing courses to other departments, if such departments think this would be beneficial to their programs.

Experiential Learning

- To facilitate greater opportunities for independent study, encourage department chairs to request funds in their instructional budgets to cover some of the teaching for faculty heavily involved in supervising students doing independent study.

- Publicize the availability of Discover Grants, a $50,000 program to expand undergraduate research opportunities. Proposals are accepted from either students or faculty but must include at least one faculty advisor.

- To ensure that all faculty interested in including community-engaged activities in their courses can do so, continue to publicize and support the Community-Engaged Learning Fund.

- Standardize the numbering of 39x courses across departments.

Global Engagement

- To facilitate student participation, departments should identify several international programs that it can particularly recommend to its majors for study abroad.

Career Preparation

- Appoint a small committee to oversee and coordinate various initiatives that are currently under way or under consideration, including development of an e-portfolio program, a proposed career and internship center course, additional upper-level writing courses as described above, and the KEY program.

Introduction

In late fall 2014, the dean of Arts, Sciences & Engineering charged the College Curriculum Review Committee (CRC) with review of primary areas of the academic experience that are shared by all undergraduates in the College: the Rochester Curriculum, experiential learning, research, global engagement, and professional development. The rationale for broad undergraduate education review at this time was two-fold. The Rochester Curriculum was approved in 1995 by the Faculty Council and went into effect starting with the Class of 2000. Although widely popular with our students and prospective students, the curriculum has not been thoroughly reviewed since its inception. Similarly, undergraduate research has long been a pillar of AS&E experiential learning opportunities; the committee's charge, therefore, is to review and enhance this area. The demand by our students to expand opportunities for them to develop beyond traditional classroom experiences via other experiential learning, global engagement, and professional development opportunities has grown during the past five years. The 2012 AS&E Experiential Learning Committee's recommendations initiated new programs in these areas. Therefore, the CRC review of the range of new opportunities is essential to ensure seamless connection between degree program experiences and College-wide academic experiences.

Accordingly, Peter Lennie and Rich Feldman assembled a committee composed of faculty from across AS&E and the College, staff members, and students:

- Loisa Bennetto
- Mark Bocko[1]
- Gerald Gamm
- John Givens
- Jennifer Grotz[1]
- John Jaenike
- Stu Jordan
- Barbara Masi
- Stephen McAleavey
- Suzanne O'Brien
- Jonathan Pakianathan
- Emily Cihon Fehnel (administrative assistance)
- Antoinette Esce[1] (student)
- Hanna Schwartzbaum[1] (student)
- Erinmarie Byrnes[2] (student)
- Emma Pollock[2] (student)

[1] AY 2014–15; [2] AY 2015–16

Our committee met at the end of the fall 2014 semester and continued with biweekly meetings throughout the spring 2015 semester and weekly meetings in the fall of 2015. In general, each meeting was devoted to a particular topic, such as global engagement or independent research. Because the content of individual majors falls within departments, the committee did not consider requirements for any individual majors.

Overview of the Rochester Curriculum

We strongly endorse the principles of the Rochester Curriculum, and we recommend that the Curriculum be maintained in its current form. While we see opportunities for small improvements, which we outline below, we are persuaded that the Rochester Curriculum is a singularly robust framework for encouraging students to identify their core interests, to pursue them with intensity, and to explore other academic areas as well.

The Rochester Curriculum—specifically, the combination of writing requirements, a major in one division, and (except for engineers) a three-course cluster in each of the other two divisions—enables students to build their education around areas that interest them and maximizes opportunities for them to explore and discover new areas of interest. Thus, the curriculum provides a great deal of freedom and flexibility. By taking courses in each of the three divisions, students are exposed to a variety of types of knowledge and methods of inquiry.

By encouraging exploration, the Rochester Curriculum may help students discover areas in which to major, minor, or pursue a second major. The Curriculum is particularly beneficial to students who initially intend to major in one area but then switch. In this case, they will have already been exposed to other areas that they are interested in. The system is also helpful to students who don't know what they want to major in, as it allows them to explore a variety of areas simultaneously during the freshman and sophomore years.

The Rochester Curriculum is not just about diversification and pursuit of one's interests. The system encourages and empowers exploration outside one's comfort zone and encourages students to take control of their education and start developing independence, rather than handing them a checklist of requirements to be met.

The Rochester Curriculum is founded on three principles: freedom, passion, and discipline.

Undergraduate education at the University of Rochester is premised, first, on the idea that students should have the autonomy to decide for themselves what subjects they will

pursue. This is the principle of *freedom.* Rather than require that all students take classes to satisfy requirements set by others, whether termed "General Education" or a "Core Curriculum," the Rochester Curriculum demands that students themselves select their areas of interest. The best measure of the Rochester Curriculum's success comes not in student appraisals of their clusters but instead in the decisions that students make in choosing their majors and minors. Because students enter Rochester with no preset requirements, the Curriculum encourages them to use all of their first- and second-year courses (except their course satisfying the primary writing requirement) to explore potential majors, take courses relevant for a future career, and develop other fields of interest.

This period of early exploration is one of the signature strengths of the Rochester Curriculum. Without the necessity of taking university-mandated courses outside their areas of interest, Rochester students have two full years to investigate a variety of subjects before settling on their majors and/or minors. The Curriculum is guided by the conviction that no two students are identical—that therefore all students should decide for themselves what coursework is most relevant to them. The Curriculum is equally guided by the belief that no student knows in high school who he or she will be four years later; thus, in providing time and space for extensive exploration, the Curriculum gives students an opportunity to determine what mix of majors, minors, and clusters suits them best. In making these decisions, every student (except those in some engineering majors, who choose two subjects) identifies at least three subjects as their own—one each in the Humanities, Social Sciences, and Natural Sciences and Engineering.

A second principle of the Rochester Curriculum is passion. We believe that students should love what they study, and that they should study what they love. This principle grows out of the University's dual identity as a research university and a small college. Faculty at a research university do their best work when their research agendas reflect their interests
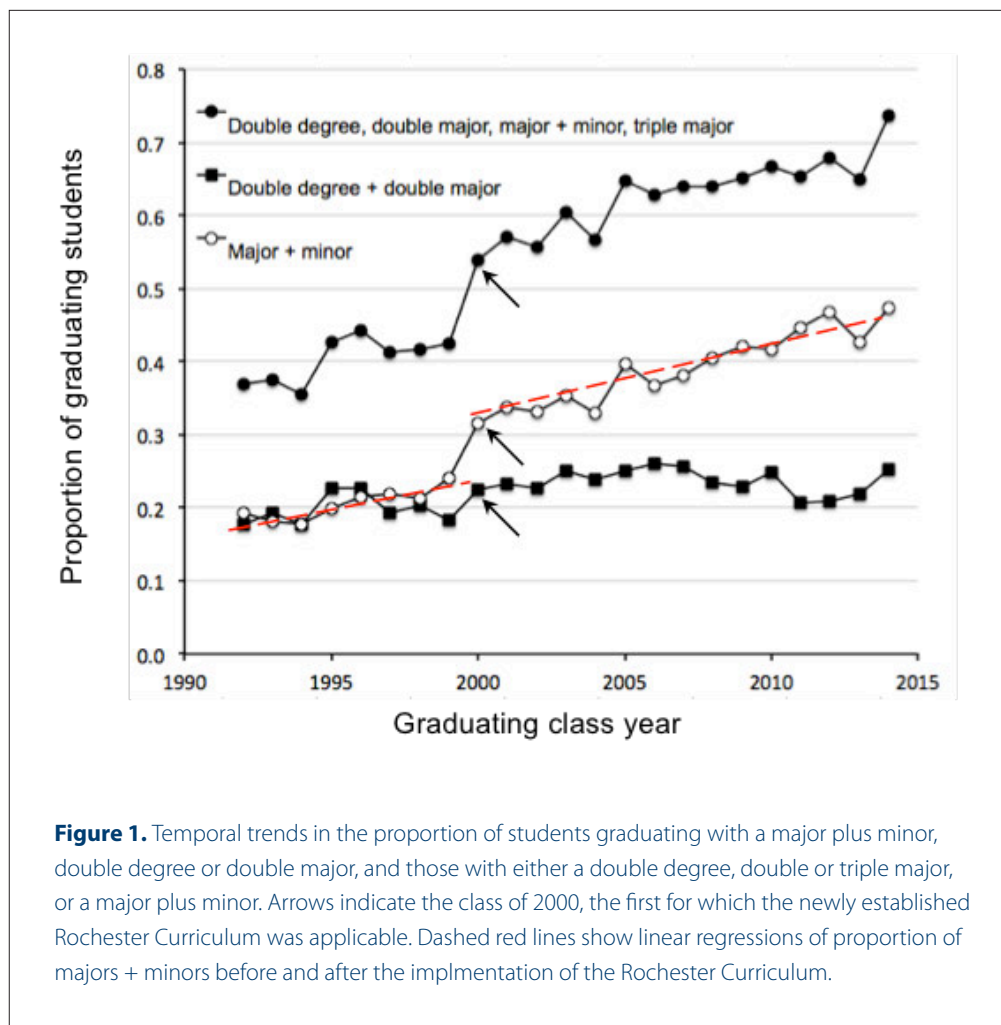
Figure 1. Temporal trends in the proportion of students graduating with a major plus minor, double degree or double major, and those with either a double degree, double or triple major, or a major plus minor. Arrows indicate the class of 2000, the first for which the newly established Rochester Curriculum was applicable. Dashed red lines show linear regressions of proportion of majors + minors before and after the implmentation of the Rochester Curriculum.

and passions. And students at any college do best when they themselves choose among an array of cocurricular options. Applying this principle to undergraduate education, the Rochester Curriculum encourages students to pursue areas that challenge and stimulate them.

Finally, the Rochester Curriculum requires discipline. While the Curriculum facilitates broad exploration, it also demands that students ultimately select subjects to study, that these subjects be spread across different areas of knowledge, and that these subjects be pursued with structure. Each cluster represents a set of courses that are internally coherent, and majors and minors similarly require substantial commitment.

Impact of the Rochester Curriculum

An important impact of the Rochester Curriculum is that by encouraging and enabling students to pursue subjects of greatest interest to them, a substantial fraction of students end up pursuing double (or even triple) majors or a combination of a major and a minor. Figure 1 shows the fraction of students who graduated with a 1) a major plus minor, 2) a double major or double degree, or 3) a double or triple major, double degree,

or major plus minor through time. There is clearly an upward trend for the combined category 3, with most of this effect being due to the increase in the number of students graduating with a major plus minor. Notice particularly the jump for the class of 2000 (identified by arrows in the figure), the first year for which the Rochester Curriculum went into effect. Both the slope and 1992-intercepts were significantly greater for the period 2000–14 than for 1992–99. Forward projection of the 1992–99 trend to 2000 yields a value of 0.238, whereas the actual 2000 value was 0.315. Thus, these temporal trends suggest that the Rochester Curriculum resulted in a 7.7 percent absolute (32 percent proportional) jump in the fraction of students graduating with a major plus minor in the year 2000 and that the effects of this jump are still evident in today's students. (The precision of these estimates should not be taken too seriously, as we have not estimated confidence limits around them.)

The committee reviewed data that examined a wide range of student paths as a function of primary major division. The review supported the conclusion that our students are using the flexible Rochester Curriculum toward completion of substantial academic work in majors, minors, and clusters beyond their primary major. The end result is that all students are completing an undergraduate education that includes sufficient cross-divisional academic coursework that substantially prepares all students to make well-reasoned judgments outside of their primary major; expand their cultural and global awareness; and develop their quantitative, scientific, and critical reasoning abilities, as well as technological competency and information literacy abilities.

There are downsides to the curriculum as well. The committee spent a good deal of time grappling with the tradeoff between freedom and flexibility (strengths of our present curriculum) and breadth of knowledge (a strength of curricula with traditional general education requirements). Taking a single cluster within a division clearly does not expose students to the variety of types of knowledge or means of inquiry in various fields within that division. This could be especially true of clusters like introductory courses in calculus (natural sciences) or foreign languages (humanities). On balance, however, the committee comes down strongly in favor of the current structure of distributional general education requirements.

Recommendations

- To maximize the freedom of students to explore different areas without worrying about meeting various requirements, we recommend minimizing dead-end tracks that cannot be used to fulfill the requirements of a major or cluster. Specifically, the committee recommends that

every introductory-level course be included in a cluster, so that any course a student takes could potentially be used for either a major or a cluster. We consider introductory courses to be those that are typically taken by freshmen and sophomores, 100-level courses, and courses without prerequisites. The exceptions would be courses used to fulfill the primary writing requirement (WRT 105, etc.) and courses being taught for the first time on a trial basis, as these might not get taught again. Such courses could be included in a cluster by petition. Where appropriate, a department could take steps to ensure that their majors get first access to required introductory courses.

- Explain the rationale and goals of the Rochester Curriculum clearly to freshmen, as well as to both major and pre-major (freshmen) advisors.

- Minimize dead ends by eliminating clusters that are dependent on courses that have not been taught in the last two to three years. Note: as a result of a new ruling by the College Curriculum Committee, clusters that are dependent on courses not taught in last five years have been or are in the process of being eliminated. The five-year limit protects current undergraduates.

- Discontinue allowing AP course/exam credit to be used as part of a math cluster, as this is the only AP credit that students are currently allowed to use as part of a cluster. This recommendation is currently being implemented.

- We envision bonus clusters completed by a student beyond those used to meet the distributional requirements and to be listed on the transcript. This category would include a second cluster taken by engineering students, as they are required to take only one cluster either in humanities or social sciences. Recognition of bonus clusters encourages students to explore new areas and pursue them in some depth. In addition, certain types of bonus clusters, such as foreign language or web design, could be beneficial in terms of career preparation and therefore of interest to potential employers. We recommend the following restrictions:

  - Students must choose among listed, existing clusters.

  - Students may list no more than two bonus clusters on their transcripts.

  - A student must complete the cluster before it will be processed by the College Center for Advising Services (CCAS).

  - A bonus cluster may overlap by no more than one course with the requirements of a student's major or

minor, including the associated prerequisite, allied field, ancillary, and foundational courses. There may be no overlap with any other clusters, including those used to satisfy distributional requirements and other bonus clusters. Note that these restrictions for overlap with ancillary courses and between clusters are more stringent than rules that apply to clusters used to fulfill distributional requirements.

- The Rochester Curriculum is a unique and highly successful means by which students are encouraged and enabled to explore various avenues of academic interest and pursue those areas that most deeply engage them. As a way to officially recognize their specific pursuit, the committee recommends indicating a student's major(s) on bachelor of arts diplomas, as they were in the past and as is currently done for bachelor of science degrees in AS&E.

- The College Curriculum Committee should review its process for approving new clusters to ensure that new clusters continue to support student achievement of a cross-divisional education that develops essential student abilities in quantitative, scientific, and critical reasoning; global and cultural awareness; and technological and information literacy.

Writing and Communication

A second important component of the Rochester Curriculum is the writing requirement, including primary writing and upper-level writing within specific disciplines (the student's major). In general, effective writing is essential for both communication with others and clarifying one's own thinking. Deborah Rossen-Knill, director of the College's Writing, Speaking, and Argument Program, provided an overview of the writing program (writing.rochester.edu), along with recent developments initiated by her office.

Primary Writing Requirement (PWR). This requirement can be fulfilled via several pathways:

- **WRT 105**—standard freshman course; one semester long.

- **WRT 105E**—this course provides additional support to students and, if necessary, extended time to complete a course that is started in the fall. The work can be completed the following spring semester or even later. Currently, this option is most often chosen by international students but is also chosen by less-well-prepared US students.

- **WRT 105A + 105B**—This is a new option. Each course carries 2 credits. WRT 105A is offered in the fall and 105B

in the spring. The pace is slower than 105 or 105E and thus allows a student more time to develop as writer.

- **WRT 101-104 (EAPP program)**—Students take WRT 101 and 103 in the fall and 102 and 104 in the spring. WRT 101 and 102 each carries 2 credits, while WRT 103 and 104 each carries 6 credits. The Admissions Office selects the students, and the goal of this course sequence is to get the students up to speed for University-level work.

- Petition the Writing Center to place out of WRT 105 and substitute another writing-intensive Rochester course.

Because of the variety of options, students should be referred to the Writing Center for placement questions.

Upper-Level Writing

Beginning with the Class of 2001, the upper-level writing requirement has been a part of every major in AS&E. It typically was met by taking courses within individual departments. In recent years, however, individuals from the Writing Program have worked with specific departments to develop and offer discipline-specific courses. These include Katherine Schaefer (biology), Kathryn Phillips (psychology), Whitney Gegg-Harrison (engineering), and Rachel Lee (digital writing). Examples of such courses include Writing in a Digital World (WRT 261/DMS 250), Communicating Your Professional Identity in Psychology (WRT 274/CSP 274W/PSY 274W) and Communicating Your Professional Identity in Biology (WRT 272/BIO 272W). The creation of these courses has been a positive development. In particular, they ensure a level of quality control and consistency in upper-level writing courses. We recognize that the content of these courses may differ from the writing assignments traditionally associated with upper-level writing classes. In the more traditional courses, the writing assignments tended to be research papers, lab reports, or papers developing an extended argument of the sort used professionally within the discipline. However, the newer courses provide specific instruction on communicating to different audiences, not only to professional peers, and will be helpful to students in their career and internship planning. (Note that Communicating Your Professional Identity (WRT 273) is required of all Engineering majors but is not part of the upper-level writing requirement.)

Recommendations

- Expand the involvement of the Writing Program in upper-level writing courses to other departments, if such departments think this would be beneficial to their programs.

- Although we encourage the development of courses like WRT 273, we recommend that all students take at least one traditional upper-level writing course, as described above.

- Do not allow incoming students to preregister for WRT 105 or other primary writing courses, except ECO (Early Connection Opportunity) and EAPP (English for Academic Purposes Program) students. There are two reasons for this. First, disallowing preregistration equalizes the ability for all students to register for the WRT 105 section of their choice. In addition, this can create scheduling conflicts with courses they must have (e.g., MTH, CHM, BIO) for their prospective majors. It would be better to register first for these required courses (including labs and workshops) and then determine which WRT 105 sections fit a student's schedule and interests.

  The College initiated a preregistration process at a time in the past when registration was a cumbersome process involving long lines at registration desks and paper wait-lists. With online registration, the process is now much simpler, so that students can more easily work with an adviser to select courses and then register and make changes as needed. With this newer online registration process, preregistering for WRT 105 reduces a student's degree of freedom in course selection, thus complicating discussions with the advisor and reducing the level of flexibility for exploration inherent in the Rochester Curriculum.

  More generally, students are better prepared to make informed choices about course selection after meeting with their advisors and speaking with a writing advisor. Because all incoming freshmen meet with advisors during Orientation, this is the best time for students to select the most appropriate and most interesting PWR course.

- Institute an earlier add/drop date—two weeks into the semester—for Primary Writing Requirement courses. After two weeks, students have already turned in one or more written assignments and thus would have significant catching up to do if they were to switch to a different PWR course.

Experiential Learning

The College offers a variety of experiential learning opportunities. Among the most important of these are Independent Study and Independent Research courses. Many students—both prospective and matriculated—express interest in doing independent research, and the University of Rochester is a particularly good place for this. Steve Manly

presented an overview of independent study courses (39x), including undergraduate research, to the committee. Although the College offers exceptional opportunities for such independent research, there are a variety of issues that should be addressed. Thus, we will mention specific recommendations after each issue.

Barriers to student research

Perhaps the most important challenge is finding research opportunities for students, specifically, matching them to appropriate faculty who are willing to supervise students doing independent research.

According to the new AS&E flyer entitled "Student Research with Faculty," students may gain research experiences by doing Independent Study: Research (course credit, no pay), serving as a Research Assistant (pay, but no course credit), or by undertaking an Unpaid Research Experience (neither pay nor course credit). Any of these may be done either in the academic year or the summer. This flyer includes a new "College Notification Form for Unpaid Research Experience" that is to be submitted to the Office of Undergraduate Research.

The River Campus Libraries, under the leadership of Mary Ann Mavrinac, is proposing the development of a new student research space in Carlson Library. This dedicated space will be designed to bring together students, researchers, faculty, and librarians in a centralized, IT-rich environment. The goal of this initiative is to help students prepare to do independent research, get exposure to advanced researchers, and network with peers and faculty. The space also will be used to hold workshops and seminars, provide space for collaborative research and consultations with librarians, and house computer workstations with access to specialized programs. This project is currently in the piloting and prototyping phase, with fundraising occurring in parallel to provide physical upgrades to the first floor of the Carlson Library to support this program.

Recommendations

- To facilitate greater opportunities for independent study, we encourage department chairs to request funds in their instructional budgets to cover some of the teaching for faculty heavily involved in supervising students doing independent study.

- Provide guidance to students on how to approach faculty with whom they might like to do independent research. This is one of the aims of the new undergraduate research fair. In addition, undergraduate councils (e.g., SUBS—the

Society of Undergraduate Biology Students) could play an important role in this. Finally, the Department of Brain and Cognitive Sciences has a class that prepares students for independent research. The committee recommends that individual departments consider how they prepare first- and second-year students for subsequent research. Further guidance on this is provided on the Undergraduate Research website: www.rochester.edu/college/ugresearch/started.html.

- Use the undergraduate research fair to make students aware of the variety of opportunities for independent research at Rochester and to assist them in developing strategies to approach potential faculty mentors.

- A recent article in *Science* (Linn et al. 2015, Undergraduate research opportunities. Science 347: 627) stated, "Sustained participation (three or more semesters) in a URE [undergraduate research experience] builds identity as a scientist, whereas intermittent URE participation can be a negative experience and short UREs have little to no benefit." The College's Advisor's Handbook, quoting faculty policy, states that "Students are allowed to take no more than eight credits of Independent Studies courses with the same instructor unless approved by the dean, which is normally granted for senior honors projects approved by the department chair." This policy is at odds with what is apparently the best practice for undergraduate research experience. Thus, we recommend lessening this restriction to "Students wishing to take more than eight credits of Independent Studies courses with the same instructor will need approval from the department chair." Requiring the chair's approval could serve as a check to prevent unwarranted continuation of a project.

- We encourage individual departments to get involved with the Carlson Student Research Space, as this will foster the development of a more open, interactive, and collaborative research environment for our students.

- Provide support and recognition to graduate students and postdoctoral fellows, who often play an important role in supervising and mentoring undergraduate independent study students. One possibility would be College-wide or department-level awards to recognize outstanding student mentoring, as is currently done in the School of Medicine and Dentistry.

Funding

Research and Innovation Grants (RIG) are awarded to select incoming freshmen. The number of students receiving such awards has been increasing, with 525 of our current students having been awarded such grants. These grants improve the yield of our better applicants. Because grants are portable, can be used to work with any faculty member, and can be used to support summer research, they are especially good for carrying out research that would be otherwise difficult to fund.

In the committee discussions, it became evident that we lack clear guidelines on when undergraduate research assistants should be paid and when they should register for a 39x course. This seems to vary among departments. In addition, there are new employment codes to distinguish different levels of lab work (e.g., dishwasher versus research assistant who helps with an experiment).

The Community-Engaged Learning Fund awards grants to faculty and staff whose projects or courses combine academic learning and community engagement opportunities for undergraduate students in Arts, Sciences & Engineering. The purpose of these grants is to support valuable community-University partnerships and enhance students' learning outcomes. Successful projects achieve this by integrating community-based experiential opportunities in the Rochester area with traditional classroom learning. Grant funds can be used to support any expense associated with the course or project, such as event tickets, costs of transportation, expenses partner organizations incur as part of their participation, and event support.

Recommendations

- Publicize the availability of Discover Grants, a $50,000 program to expand undergraduate research opportunities. Proposals are accepted from either students or faculty but must include at least one faculty advisor. These grants can also support 391 or 395 courses. Although these are already being publicized, we recommend doing so even more, as some faculty are unaware of this opportunity.

- Develop guidelines, on a department-by-department basis, to determine the conditions under which undergraduate research assistants should be paid and when they should register for credit-bearing 39x courses.

- To ensure that all faculty interested in including community-engaged activities in their courses can do so, continue to publicize and support the Community-Engaged Learning Fund.

Course numbering

There is variation among departments in the course numbers used for undergraduate research. For instance, Political Science uses 391 (Independent Study), while Biology uses

395 (Independent Research). Among other things, this makes it difficult to track levels of undergraduate research. Steve Manly presented data that made it evident that there were large discrepancies between the number of students who actually took independent study and the numbers for which the registrar had records. This is apparently because some departments did not use the online system with the registrar. Since the initial draft of this report was submitted in May 2015, it is now the case that every undergraduate who wants to earn academic credit for any 39x course must submit an electronic Independent Studies form online.

The various course numbers associated with undergraduate research come from the Faculty Rules (cited in the Advisor's Handbook; www.rochester.edu/college/CCAS/AdviserHandbook/IndependentSt.html) and include

- 391 Independent Study
- 392 Practicum
- 393 Senior Project
- 394 Internship
- 395 Research
- 396 Research (Hajim School courses only)

Other than 394 (which is described in more detail on the website), there does not appear to be a clear description of what distinguishes 391, 392, 393, 395, and 396. RESEARCH is numbered 395 in Arts & Sciences and 396 in Engineering. Adding to the confusion is that CAS 396 (A, B, C, and I) courses are 0-credit internships.

Recommendations

- If possible, standardize 39x numbering across departments. If that is not feasible, then each department should develop its own guidelines. This will make it easier for students to register for the appropriate type of course and will facilitate tracking the number of students doing independent research. James Zavislan, associate dean in the Hajim School, recently informed committee member Suzanne O'Brien that beginning in fall 2016, departments in the Hajim School will use the 390-395 numbers as prescribed by our faculty and will no longer use 396 for independent study of any kind, including research.

- It would be helpful to have a contact person within each department who oversees administrative aspects of 39x courses.

Global Engagement

The concept of global engagement in the undergraduate curriculum is complex and multifaceted, comprising such areas as study abroad by our students at other institutions, courses taught abroad by Rochester faculty, incorporation of a global perspective in our courses, study of foreign languages, and the large population of international students among our undergraduates.

To get an overview of this area, committee member Jennifer Grotz attended a one-day conference, "Global competence, local challenges: building an international curriculum for everyone," sponsored by the American Council on Education. Important points that came out of the meeting include the findings that: 1) study abroad is often the single most important experience for undergraduates, but at most schools only a small fraction of students actually do this; 2) some schools require study abroad, which can be done as early as the freshman year; 3) study abroad could be as short as a couple of weeks; 4) foreign language study prior to going abroad is beneficial; 5) incorporation of a global perspective in the classroom is desirable; and 6) some schools require that students take at least two courses with a global component as part of their general education requirements.

Jane Gatewood (associate provost for Global Engagement) met with our committee to discuss a variety of aspects of global engagement as it pertains to the University of Rochester. Student mobility involves, on the one hand, international students who come here as degree-seeking or short-term students and, on the other hand, University of Rochester students who participate in education abroad or international internships.

Internships are increasingly popular, especially among STEM students. However, internship opportunities that integrate well with students' majors and programs of study can be challenging to find and organize, as they are not a traditional form of study abroad. Gatewood indicated that working closely with targeted partner institutions can lead to pathways for internships or research training. She reported that she had some success with this with Korean institutions that have strong ties to industry.

The number of international students on campus has increased greatly in recent years. The committee discussed the potential needs both of these students and of those teaching them. Faculty and graduate student teaching assistants may need training related to the needs of international students, many of whom come to the University with learning styles different from those of domestic students.

With respect to incorporation of global engagement into the Rochester Curriculum, Gatewood stressed the need to focus on the specific student outcomes we are aiming for and the specific means to achieve these outcomes. Because the desired student outcomes are likely to vary among majors and disciplines, each department may wish to specify the types of outcomes they would like to see in their students who engage internationally (e.g., fluency in a foreign language, ability to work in a different cultural settings or in international teams, appreciation of cultural similarities and differences between the United States and other countries). Once these objectives are clarified, specific international opportunities can be identified and/or developed for students in various disciplines.

With respect to partner institutions for study abroad, Gatewood indicated that the best ones are those with which the University has a variety of interactions, including exchange of undergraduates, graduate students, and faculty. Developing comprehensive partnerships with targeted institutions will lead to greater familiarity between the two institutions, and this in turn increases the potential for research collaborations, joint grant funding, etc.

Jacqueline Levine (assistant dean and director of the College Center for Study Abroad) presented an overview of what is now termed "Education Abroad" to the committee. Study abroad provides opportunities to develop intercultural skills and exposure to diversity of all kinds. In addition, it poses challenges to students and opportunities for personal growth. While most students do study abroad their junior year, Levine indicated that the sophomore year might be preferable for some students. Importantly, doing study abroad does not increase time to graduation among our students.

Although study abroad can be one of the most important experiences for undergraduates, the participation rate by Rochester students is lower than one would like, although it is comparable to the rate at our peer institutions. Among Rochester students, the most underrepresented groups are students majoring in science and engineering, athletes, males, students with learning disabilities, LGBTQ students, student leaders, first-generation students, and some racial and ethnic groups. Currently, study abroad is required of all International Relations majors, and there is a high rate of participation by students majoring in foreign languages. Engineering departments are encouraging their students to participate, and the Hajim School has a web page listing approved courses at numerous foreign institutions, along with their Rochester course equivalents.

Most courses at Rochester-affiliated programs are suitable for elective credit, but any courses used in the major must be approved by a student's major advisor. However, it can sometimes be difficult for Rochester students to get into particular courses in these programs, as our students might lack the appropriate background preparation.

Recommendations

- Increase student participation in globally oriented activities (particularly study abroad) by increasing student awareness of them and making them more accessible. Department-specific aims for learning outcomes stemming from study abroad and for the means to achieve this could increase participation in some areas.

- Encourage students to study the language and culture of the country in which they will be doing study abroad.

- Prior approval of courses is important to encourage student participation. The Education Abroad office can provide guidance to students, but departments need to provide final approval for courses in the major. Certain departments might consider developing a list of approved courses, as the Hajim School has done. However, even with such lists, students should be required to meet with a departmental advisor for final approval. Students should be cautioned that a course suitable for one student may not be so for another, and that a previously approved course may have been changed and no longer be suitable for Rochester students. Finally, lists of approved courses should not be viewed as complete.

- Major advisors should not provide "provisional approval" for study abroad courses, as students should know in advance that a course has been approved for their major or transfer credit.

- To facilitate student participation, certain departments might identify several international programs that it can particularly recommend to its majors for study abroad. Departments could begin by considering the list of programs at www.rochester.edu/College/abroad/programs/index.html. Because STEM majors are underrepresented among students participating in study abroad, departments in these areas could examine links to science courses at www.rochester.edu/College/abroad/assets/pdf/Links_Science_Courses.pdf.

- Although most students do study abroad when they are juniors, encourage students to consider doing this their sophomore year.

- Focus on partner institutions with one to one exchanges. To increase opportunities for Rochester students, the

University should expand the number of such partner institutions or the number of students exchanged with each such institution. The Office for Global Engagement, under Jane Gatewood, is currently working on this.

Global Engagement as a Curricular Requirement

The committee heard suggestions that global engagement be added as a curricular requirement, that faculty be encouraged to incorporate this into their courses where appropriate, and that courses including material on global engagement be labeled in some manner on the registrar's site (to enable students to identify such courses) and/or on their transcripts (to show that they had taken such courses). After discussion, the committee decided not to make a recommendation along these lines, as there is a variety of other areas one could argue should also be emphasized, including, for example, ethnic, racial, and cultural diversity; innovation and creativity; gender studies; environmental change and sustainability; and ethics. Requiring or encouraging students or faculty to focus on all of these areas would be overly burdensome. Even identifying courses that focus or touch on these areas could prove unwieldy, resulting in course listings resembling alphabet soup. Thus, the committee does not recommend requiring or highlighting specific areas, even though they are important and of broad interest.

Career Preparation

As a liberal arts institution, the University of Rochester is not a trade school and does not take a job-training approach to the undergraduate education. However, because the Rochester Curriculum emphasizes studying what you love, we do want to help students find a path forward to continue following their interests after graduation. To an important—but not exclusive—extent, that involves finding the right career area and finding a job in that area. Thus, we do advocate supporting programs that will empower students in their search for the right career path and enabling them to pursue it once found. To that end, the committee heard from several individuals about various College initiatives that can serve this need.

Joseph Testani (the new director of the Gwen M. Greene Career and Internship Center) met with the committee to provide information on how the College curriculum can help meet the growing desire on the part of students for some level of career preparation at the undergraduate level. He stressed that he uses the term career broadly to include a variety of options following graduation, such as graduate school, the Peace Corps, Teach for America, and traditional jobs.

Because most individuals tend to follow a circuitous—rather than linear—career path, training for a specific trade is a sub-optimal strategy for long-term career preparation. Instead, it is a set of core competencies that are most important, and it is in these areas that the College curriculum should strive to prepare students for successful and rewarding careers. These competencies include critical thinking and problem solving, oral and written communication (to a variety of audiences), collaboration and teamwork, IT competency, leadership, professionalism, and ethics. While the curriculum addresses most of these issues to some extent, we note that extracurricular activities and student life in general play an important role, especially in such areas as collaboration, teamwork, leadership, professionalism, and ethics.

Career-related initiatives currently being offered or considered include the following:

1. **ePortfolios**—This is a newly launched initiative that resulted from the "digital portfolio" recommendation in the 2013 final report of the Educational Technology Committee. ePortfolio instruction and management is being overseen by Barbara Masi (director of Education Innovation and Assessment Initiatives in the dean's office). Part of this is a 1-credit course, "Preparing your Academic and Professional ePortfolio" (CAS 111), to be taught by Masi and staff from CCAS for the first time in spring 2016. The course, CAS 111, is offered to all undergraduates and gets students started in using ePortfolios as a tool for academic and professional development. An ePortfolio is a "digital record of a student's academic and career goals, as well as presentations of career explorations, projects and other important undergraduate experiences." In the ideal, students begin their ePortfolios in the freshman year and continue throughout a student's undergraduate years. It includes both a nonpublic component, where students reflect upon and articulate their interests and aspirations, and a public component, where students can present materials, including multimedia presentations, for the outside world. The latter component can facilitate networking and collaboration, finding internship and job possibilities, etc. The course, CAS 111, particularly targets students who are unsure of how to develop academic and career goals and how to develop doable action plans for achieving those goals. The course ends with students writing a proposal for research, club projects, or internship engagement that allows them to gain concrete experiences.

2. **Career and Internship Center course**—Currently, fewer than half of colleges and universities in the United States offer any career-oriented courses. In those that do, the

courses range from 0 to 3 credits and may be either required or taken as electives. Joseph Testani discussed a possible sophomore-level course that the Career Center might develop. The course could include a variety of options, such as career exploration, self-assessment and professional prognosis, communication, preparation for internships and graduate school, experiential learning, and an overview of career readiness and core competencies. Core competencies include such things as critical thinking, problem solving, written and oral communication, collaboration, IT competence, leadership, professionalism and work ethic, and career management.

3. **Upper-level writing courses**—As discussed above in the Writing and Communication section, several departments now offer upper-level writing courses with instructional support from the Writing, Speaking, and Argument Program. Examples include Developing a Professional Biology Writing Portfolio (WRT 272), Communicating Your Professional Identity in Engineering (WRT 273), Communicating Your Professional Identity in Psychology (WRT 274), and Writing in a Digital World (WRT 261). These courses focus on effective written and oral communication with a variety of audiences. In addition, students develop a portfolio of materials that can be helpful for finding internships and for pursuing their postgraduate goals, such as graduate school or a job. These courses are often taken in the junior year. The Digital Media Studies program is piloting a new course, Digital Portfolio (DMS 200), which joins an industry project experience with professional portfolio development.

4. **Kauffman Entrepreneurial Year Program.** This program, which provides a fifth year tuition free, is open to all students in the College except Take Five Scholars and first-semester transfer students. The programs of study are often career related, including such things as internships, special projects, coursework, business plan development, and research about entrepreneurship.

5. **Internships**—Internships, which can be taken at any time in a student's college career, provide opportunities for experiential learning and in some fields lead directly to job offers upon graduation. This important topic is being considered by another committee that is chaired by Joe Testani.

6. **The Barbara J. Burger iZone**—The iZone, as described in a report from River Campus Libraries, is envisioned as space in Rush Rhees Library where students can explore innovative ideas having social, community, cultural, or economic impact; make connections with potential like-minded collaborators; and get advice on pursuing their ideas. This initiative is currently in a fundraising phase to provide physical upgrades to the ground floor and mezzanine of the Rush Rhees Library to support this program. Partners include the College and the Center for Entrepreneurship.

Recommendations

- Because of the sequential nature of items one through four above, these initiatives have the potential to be woven together into a coherent whole. However, because they are emerging from different offices on campus (the Office of the Deans; the Career and Internship Center; the Writing, Speaking, and Argument Program; and the College Center for Advising Services, respectively), we recommend the appointment of a small committee to oversee and coordinate these initiatives. There should be appropriate representation by the participating offices as well as select departments. Such an integrated set of initiatives will help assure prospective students—and their parents—that the University of Rochester is aware of the challenging job market and the importance of early planning for life after graduation. These initiatives will also facilitate means by which current students can develop ways of thinking, reflection, networking, communicating, etc. that will help them determine an appropriate career path and then to pursue it.

- As for the Carlson Student Research Space, we encourage individual departments to get involved with the iZone project, as this will lead to a more open and collaborative environment for the development of innovative ideas by our students.

Conclusion

The Rochester Curriculum is a unique and highly successful means by which students are encouraged and enabled to explore various avenues of academic interest and pursue those areas that most deeply engage them. Our committee does not recommend any major changes to the curriculum but rather a number of modest changes that we believe will facilitate greater freedom for student exploration of various areas and better prepare students for life after college.

Curriculum Review Committee Members

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