

ARTS & SCIENCES CURRICULUM COMMITTEE FINAL REPORT

March 20, 2018

This report comprises the results of the curriculum review process initiated in January 2016 by Dean Gretchen Ritter. Current Committee members include:

Tom Pepinsky, Government, Chair
Gerard Aching, Africana Studies & Romance Studies
Anindita Banerjee, Comparative Literature
Claire Cardie, Information Science & Computer Science
Derek Chang, History & Asian-American Studies
Leighton Cook '18, Student
Brian Crane, Chemistry and Chemical Biology
Melissa Ferguson, Psychology
Kelly Liu, Molecular Biology & Genetics
Derk Pereboom, Philosophy
Ravi Ramakrishna, Mathematics
Kim Weeden, Sociology
Nathan Weierich '18, Student
Rachel Bean, Senior Associate Dean for Undergraduate Education (ex-officio since July 2017)

OVERVIEW OF THE COMMITTEE'S TIMELINE

In spring 2016, the Committee [was charged](#) to undertake a review of the Arts & Sciences curriculum by gathering data, drafting potential scenarios for curriculum frameworks, and exploring connections to pedagogy. In fall 2016, the Committee activated college-wide discussions around the curriculum, forming a liaison group representative of all departments and academic programs in the College to act as a sounding board for the Committee and to explore the underlying principles of a liberal Arts & Sciences education. Through a public website, focus groups, meetings and town halls, the Committee solicited feedback more broadly from faculty, students and alumni on the current curriculum as well as possible alternative frameworks. In spring 2017, the Committee drafted a curriculum proposal based on this feedback and introduced the first draft of the proposal to the university community via a [public website](#) and faculty town hall. Committee members then set out to obtain feedback on the proposal by participating in more than 30 department faculty meetings and various discussions with chairs, students, and trustees, culminating in an all-faculty meeting in May 2017 where Committee members presented initial feedback and next steps for further inquiry. In fall 2017, the Committee reviewed the findings in greater depth and continued conversations with various stakeholders across the college. This final report represents the culmination of this 2 year extensive review and consultation process.

EXECUTIVE SUMMARY AND RECOMMENDATIONS

All undergraduate study culminates in achieving depth and proficiency as experienced through the major. However, the defining experience of the College's liberal arts curriculum is the opportunity to explore the breadth of our collective knowledge to inform, contextualize and enhance studies beyond that final specialization.

To that end, our review has focused on how our students can best explore our curriculum. We have identified three broad areas where we recommend that the College direct its efforts:

- **Outreach and messaging** - how faculty and advising staff communicate with undergraduates to assist in curriculum navigation, both as students enter the College and as they continue their time at Cornell.
- **Curricular requirements** - as a method to encourage exploration, including existing graduation requirements, distributional categories, breadth requirements, First-Year Writing, language, and others.
- **Curricular innovation** - faculty and student interest in innovative courses and teaching and learning strategies that recognize particular Cornell strengths, such as community engaged learning and interdisciplinary and collaborative teaching.

This Curriculum Committee Final Report takes the form of a series of recommended changes to the College curriculum in these three areas. These recommendations result from careful consideration of faculty and student responses to the draft proposal the Committee released in spring 2017.

We ask that the faculty endorse these recommendations and move forward with them as a formal proposal.

Summary of the Committee's recommendations:

Outreach, Messaging and Curriculum Navigation

- The College identify and invest resources in improving the availability and navigability of course information and the course selection experience.
- The faculty propose a resolution for the University Registrar to allow greater access to data from the course catalog so that we can build a personalized search platform at the College level.
- Pending successful outcomes of a current pilot and an assessment of scalability, the College adopt a one credit pre-major advising seminar as a requirement for all first-year students, effective Fall 2020.

Curriculum Requirements

- The current “matrix” structure of breadth and distribution requirements should be simplified into one single list of distribution categories, with the proposal that students complete one course in each of the following ten categories: Arts and Literature, Biological Sciences, Ethics and the Mind, Global Citizenship, Historical Analysis, Human Difference, Physical Sciences, Science of Society, Statistics and Data Science, Symbolic and Mathematical Reasoning.
- Students be required to take at least one course from each of five different distribution categories in their first four semesters at Cornell.
- The current language requirement be replaced with a requirement that students complete either one course taught in any language at the non-introductory level or at least two courses of at least three credits each in one language.
- The current College requirement that students complete at least two semesters of language study at the 2000-level prior to studying abroad should be removed.
- The College adopt a policy that, for the purpose of completing the language requirement, “language” means any living or extinct human language, including sign languages, offered at Cornell.
- The First-Year Writing Program should be strengthened and further supported, in particular through additional funding and programmatic support, to encourage more First-Year Writing courses in the sciences and social sciences, and innovation of First-Year Writing courses that are paired with introductory courses.

Curricular Innovation

- We endorse current faculty efforts to introduce interdisciplinary courses. These courses should be classified with a distinct enrollment code that would enhance their visibility (courses would continue to be monitored and approved by the Educational Policy Committee).
- All students in the College of Arts & Sciences be encouraged to take a community-engaged learning course during their time at Cornell. We see particular value in creating engaged learning courses that meet the requirements for Human Difference and Global Citizenship.
- We endorse the formation of a joint undergraduate curriculum governance committee, between A&S and CIS, to develop and oversee a coordinated curriculum framework for undergraduate data science pathways across the two colleges.
- The College should expand the Active Learning Initiative to incorporate more departments, and more courses within departments, and should also investigate ways to sustain the program for the long term.

MAIN FINDINGS AND DISCUSSION

The remainder of this report details our findings and our specific recommendations. These recommendations are intended to form the basis for a curriculum proposal that could go to the full College faculty for a vote.

Outreach, Messaging and Curriculum Navigation

With the move to pre-enrollment prior to commencement, and the removal of a required faculty-student meeting to discuss enrollment plans, faculty have expressed broad concern with how students sort into their courses when they arrive at Cornell. They are also concerned that students are unable to make fully informed course choices outside of their primary field of study (major or minor). The current course advertising and selection process, with search criteria focused on graduation requirements, explicitly encourages “box-checking” — taking courses solely because they fulfill, sometimes multiple, listed requirements — and discourages students from exploring courses beyond their majors. Faculty also conveyed that non-major advising can be challenging, because they feel that they have incomplete knowledge of requirements, courses, or disciplines outside of their own departments.

For their part, students made clear that they do not navigate course listings the way that faculty might imagine, by searching through lists of courses by department or program. This is compounded by poor messaging from the faculty; student feedback reflects a broad lack of understanding of or engagement with the College curriculum in its current form.

From this feedback, we have concluded that course options in the College, whether they are distribution requirements, major requirements, or electives, must be easily navigable and clear to students, advisors and other constituents.

Currently, the course roster is organized by department or program, with additional lists of courses that fulfill the College breadth requirements. Although students can search the course roster by keyword, this is only helpful if departments and instructors use keywords in their course descriptions, if students already know which keywords to use, and if the output of their search is manageable. The parallel structure of classes.cornell.edu, which only lists courses taught in the current, upcoming and prior semester, and courses.cornell.edu, which includes the full course catalog, contributes to confusion among students and faculty alike.

We recommend that the College identify and invest resources in improving the availability of course information and the course selection experience. Although our committee did not attempt to make a comprehensive list of strategies or explore feasibility or cost, we have gathered together some of the suggestions that emerged from our discussions with, and feedback from, students, advising staff, and faculty:

- Develop an algorithm for the course catalog that will suggest courses based on students' search histories, previous coursework, and keywords. As with all algorithms, this could be written to “nudge” students to explore options outside their academic comfort zone. Taking this one step further, one could have a refreshable “I feel lucky” button that presents students with the description of a random course selected from the College. Such an algorithm could also be integrated into the “Course Scheduler” feature, which is used widely among students.
- Identify topical themes that courses from many disciplines engage (e.g., inequality, ethics, big data, climate change) and of pedagogical styles (e.g., service learning, engaged learning, active learning, seminar, writing in the majors). Construct lists, separate web pages, or searchable databases of courses by these themes.
- Reduce bureaucratic barriers that discourage faculty members and departments from updating their course descriptions or course titles. Encourage instructors to write more accessible course descriptions, particularly for lower-division courses.
- Resolve the timing mismatch between the publication of the course catalog (every two years) and the publication of the course roster.

We note, however, that the College does not have control over search criteria on University Registrar-run sites like the Class Roster and Courses of Study. This limits our ability to personalize our search platform to meet our own needs. We recommend that the faculty propose a resolution for the University Registrar to allow greater access to data from the course catalog so that we can build a personalized search platform at the College level.

Future efforts to reach out to College undergraduates should bear in mind some of the lessons that we have learned about how students interact with university communications. One simple but powerful example is the importance of mobile platform compatibility for College surveys and communications. We also know that students are more inclined to read emails from senders that they personally know, such as faculty advisors, mentors, or perhaps directors of undergraduate study. Ongoing efforts should also involve the A&S Dean's Student Advisory Council, which should be a first stop for outreach to students about curricular and academic concerns.

Pre-Major Advising Seminar

A pilot of a one-credit advising seminar for first-year students was introduced in the 2017-18 academic year. The pilot expands beyond our current College advising structure, which centers around only one initial 30-minute meeting with a faculty advisor prior to the first week of classes, with a seminar setting in which each group of 10 advisees meet with their faculty advisor in a series of twelve 50-minute, weekly interactions (along with individual one-on-one meetings as students need). The pilot program involved 60 students and six faculty in the Fall 2017 semester, and 30 first year spring-admission students and three faculty in Spring 2018.

The seminar provides a variety of interesting and fun learning experiences (readings, excursions, reflections, class discussions) that explore the value of, and opportunities enabled by, a liberal arts education. It also focuses on: building skills and awareness of resources to help students navigate and meet the academic demands of the College's curriculum; enabling students to craft their own educational pathway; and creating a sense of community within A&S for first year students. The feedback from students in the pilot was very positive in terms of the seminar: providing support in their adjustment to College life; developing an understanding of the value of liberal arts; creating awareness of resources on campus; and building a relationship with their faculty advisor that meant they were comfortable seeking help. The intent is to have an expanded pilot scheme in the coming academic year, with an intent to assess whether a seminar format could be developed for all first-year students who enter the College. If so, the Committee recommends that such a first-semester advising seminar be adopted as a requirement for all incoming students, effective Fall 2020.

Curriculum Requirements

Faculty feedback on the first draft proposal released in March 2017 emphasized several areas of interest: encouraging students to explore early while not forcing them into a prescribed list of courses; striving for simplicity without erasing distinctions among the various parts of the liberal arts and sciences curriculum; revisiting the language requirement; improving and expanding first year writing opportunities; and preserving a rigorous foundation of science and mathematics. One consistent theme across all feedback was the insistence that curriculum requirements should, first and foremost, encourage exploration across the disciplines. This common value of exploration became the litmus test for all committee recommendations.

Encouraging Students to Explore Early

Our draft proposal specified that students would complete five of their distribution requirements in their first four semesters. The result is an undergraduate experience in which distributional coursework begins in the first year but does not end there. It establishes a principle of breadth before depth, but also gets out of the way when students are ready to focus more narrowly on one or more interests to achieve proficiency. This approach was widely agreed upon by faculty in feedback discussions.

We recommend that students be required to take at least one course from each of five different distribution categories in their first four semesters at Cornell. We further clarify that any course of at least three credits, at any level, may be used to fulfill an appropriate distribution requirement.¹

¹ The original draft proposal asked students to fulfill their distributional requirements via defined "foundational courses" rather than selecting from the full range of courses offered across any level.

Retaining Simplicity without Erasing Distinctions

After the release of the initial proposal defining broad “modes of inquiry,” faculty expressed concerns that although they generally agreed with student and faculty members calls for greater simplicity, these proposed categories were too broad. Our final recommendation aims to strike a balance. The Committee recommends simplifying the current “matrix” structure of breadth *and* distribution requirements to instead have one single list that better reflects the principles, priorities and strengths of the College. The change is to address concerns about the current structure, that too often results in caveats and workarounds, and incentivizes course selections that allow multiple requirements to be satisfied simultaneously, rather than allowing exploration purely based on interests. Such incentives are counter-productive and confuse the original intentions of the current curriculum structure.

We recommend an adjustment to the current list of distribution requirements, with the proposal that students complete **one course each in the following ten distribution requirements**:

Arts and Literature	Global Citizenship
Biological Sciences	Physical Sciences
Ethics and the Mind	Science of Society
Historical Analysis	Statistics and Data Science
Human Difference	Symbolic and Mathematical Reasoning

This proposed distribution would make the following changes to current requirements:

1. “Cultural Analysis” has been replaced with two categories, “Human Difference” and “Global Citizenship.”
 - a. “Human Difference,” as described in our draft proposal, encompasses courses that take class, race, nationality, ethnicity, gender, sexuality, or ability as an object of study.
 - b. “Global Citizenship” encompasses the study of societies and political systems outside of Western Europe, Canada, and the United States.
2. “Ethics and the Mind” and “Science of Society” encompass coursework that currently fulfills requirements in “Knowledge, Cognition, and Moral Reasoning” and “Social and

Foundational courses as a requirement were found to be resoundingly unpopular amongst faculty and have thus been removed from current recommendations.

Behavior Analysis,” but which does not primarily focus on those subjects covered in “Human Difference” or “Global Citizenship.”

3. “Mathematical and Quantitative Reasoning” has been replaced with two categories, “Statistics and Data Science” and “Symbolic and Mathematical Reasoning.” We address our recommendations for data science in more detail below. By broadening symbolic and mathematical reasoning, we recognize that this area of knowledge can be attained through a variety of disciplines, for example, in areas of linguistics and music theory.
4. “Physical and Biological Sciences” has been replaced with two categories, “Biological Sciences” and “Physical Sciences.”

By further adjusting our distributional categories to include global and historical breadth as well as diversity, we can simplify and streamline our curriculum while encouraging exploration across various disciplines. The current breadth requirements, “Global Breadth” and “Historical Breadth,” overlap with distribution requirements, which students and faculty advisors find confusing. Adopting a single set of requirements would remove this confusion. The structure of our recommended curriculum is simple, easy to remember, and should be easier to message to prospective, incoming and current students as well as faculty.

Some faculty express frustration with the fact that courses can currently fulfill one and only one distribution requirement (although they *may* also fulfill breadth requirements, which is a source of confusion for students and faculty alike). Nevertheless, we recommend that, consistent with current practices, all courses may be designated by faculty as fulfilling one and only one distribution requirement. An exception could be made for (1) courses introduced as interdisciplinary courses under the ARTS code (see the discussion in *Curricular Innovation*), or (2) through a formal petition made to the Educational Policy Committee.

Revisiting the Language Requirement

Faculty, from across all the disciplines, uniformly endorse the importance of language learning as an essential component of a liberal arts education. The College provides Cornell students with an extraordinarily diverse set of languages to study, and this is a defining feature of Cornell as a global university.

We learned, however, from meetings with faculty in departments from across the College, that the current language requirement leads some students to transfer out of the College, and others to focus on pathways that minimally meet the requirements, rather than exploring the language curriculum more fully. Our conversations with students echoed these concerns. We heard from students about decisions to opt to take a single 2000-level course in a frequently-taught language they started to learn in high-school, rather than venturing to learn a new language (even though that was of interest to them) because of the perceived impact the multi-semester language requirement might have in limiting other curriculum options. Of students who graduated in the last 5 years (classes of 2013-2017), 63 percent met the language

requirements by passing a course at the non-introductory level, while only 37 percent met the requirement by obtaining 11 credits in a single language.

The College has a long history and strength in teaching less commonly taught languages. Within the current requirement, these languages are at a disadvantage, because students must begin language study their first semester at Cornell if they wish to study abroad in these countries. The three course requirement may also prove intimidating for students who are unfamiliar with the less commonly taught languages that are one of Cornell's strengths.

We recommend that we replace the current language requirement — completion of one course taught in any language at or above the non-introductory level *or* at least 11 credits in one language — with a requirement that students complete one course taught in any language at the non-introductory level *or* at least two courses of three credits each in one language. The current and proposed language requirements are shown below.

<i>Current Requirement</i>	<i>Proposed Requirement</i>
One course at or above the non-introductory level	One course at or above the non-introductory level
<i>or</i>	<i>or</i>
11 credits in a single language	Two courses, at least three credits each, in a single language

We also recommend removing the current College requirement that students complete at least two semesters of language study at the 2000-level prior to studying abroad. We emphasize that this change only affects College requirements; study abroad programs remain free to impose whatever language requirements they prefer.

These recommendations respond to the central concern raised by a significant number of students and College faculty about the current language requirements. However, they also have other, more salutary benefits for language study in the College and across Cornell that emphasize exploration. As already noted, they would make study abroad accessible to more students, and thus indirectly encourage students to study language and culture in immersive settings. They would also encourage students to pursue third languages and less commonly taught languages. For instance, a student may come to Cornell with a strong background in Spanish. And although that student would prefer taking one course in Spanish at the 2000+ level to taking 11 credits in another language, that student may prefer two courses in German, Portuguese, or Swahili to that one course in Spanish. Our recommendations facilitate such a preference, which would amount to a net increase in the number of language courses taught.

Additionally, these changes do not disadvantage incoming Cornell students whose secondary schools did not offer foreign language instruction.

We encourage language-teaching departments to hold internal brainstorming workshops to respond creatively to such a transformed language requirement, as well as to consider other ways to encourage language exploration for non-majors.

We recommend further that the College adopt a policy that, for the purpose of completing the language requirement, “language” means any living or extinct human language, including sign languages, offered at Cornell.

First-Year Writing

Faculty and student commentary on the First-Year Writing Program is generally mixed. Although students and faculty appreciate the intense and deliberate focus on College-level writing, students report that quality of instruction is varied, and the demand for writing seminars in the sciences and social sciences far outstrips supply. We acknowledge that since the Committee collected this feedback, the First-Year Writing Program has taken important and thoughtful steps to improve the quality of instruction, particularly for courses taught by advanced graduate students.

We recommend that the First-Year Writing Program be strengthened and further supported, in particular through additional funding and programmatic support to encourage more First-Year Writing courses in the sciences and social sciences. We also recommend further innovation of First-Year Writing courses that are paired with introductory courses. Students who choose the paired-course option would take both courses in the same semester, and receive full credit for each course. The instructors of the two courses need not be in the same department or discipline, and indeed we think that some of the most successful pairings may come from cross-disciplinary collaborations.

Preserving a Rigorous Foundation of Science and Mathematics

This final report maintains parity with our current requirements, in which students will complete a total of four science and mathematical/quantitative reasoning courses. This responds to faculty concerns expressed following the initial curriculum proposal, in which a reduction of one requirement was proposed. Motivated by the increasing demand from students to develop statistical and data science skills, and in recognition that our faculty from across many disciplines bring relevant expertise in the application of these skills, in research and instruction, we recommend that the “Mathematical and Quantitative Reasoning” category be split into two, “Statistics and Data Science” and “Symbolic and Mathematical Reasoning”. We also recommend that our current “Physical and Biological Sciences” also be split to ensure that

our students have exposure to at least one course in each of the “Biological Sciences” and “Physical Sciences.”

Curricular Innovation

Faculty want to develop courses that draw from different disciplines, and they want to innovate pedagogically to focus on community engaged learning or applied science and social science. Yet despite the availability of funds for some teaching projects, such as Engaged Cornell and the Active Learning Initiative, faculty feel that there are few incentives to innovate the undergraduate curriculum in these directions, and many departments lack the pedagogical resources to devote faculty teaching time to small-enrollment innovations, in particular.

Here, we identify several consistent themes in our discussions with faculty: interdisciplinary (co)-teaching, community engaged learning, active learning, and data science.

Interdisciplinary Courses

Interdisciplinary courses encourage students to think from the perspective of multiple disciplines, across departments and diverse fields of study. The study of a single topic is greatly enriched by more than one disciplinary perspective, and interdisciplinary courses offer one way to make this possible. We envision that many (but perhaps not all) such courses would be team-taught.

[University Courses](#) have been designed to be interdisciplinary, and many of these courses have been successful and have enjoyed large enrollments. Examples include *Controversies about Inequality*, *History of Exploration: Land Sea and Space* and *Ethics of Eating*. University Courses serve as a model for the interdisciplinary courses that we have in mind.

Last academic year (2016/17), faculty in the College proposed two general categories for interdisciplinary courses, *Challenges Confronting Our World* and *Works, Ideas, and Methods*, which we endorse. These proposals originated in discussions of curricular revision among the Chairs of the humanities and qualitative social sciences departments in the fall of 2016. The discussion subsequently expanded to include the CIVIC committee, which was charged with planning the Provost’s hiring and scholarship initiative in the humanities and qualitative social sciences. The two general categories correspond to the two CIVIC initiatives, Public Life and Media Studies. These proposals were then presented at a meeting of the department chairs, and at a College faculty meeting at which curricular revision was discussed.

Challenges Confronting Our World. Humanity faces large-scale problems that are best approached from an interdisciplinary perspective, and academia has an important role in

seeking out and proposing solutions to these problems. Courses in this category would provide an interdisciplinary assessment of pressing issues we face. Sample topics for such courses include: the environment; climate change; race; gender; inequality; mental health; the ethics of genetic engineering; problems and prospects for democracy; and the ethics and politics of computation.

Works, Ideas, and Methods. Humanity has produced cities, monuments, art objects, literary and philosophical works, archives, performances, rites, and cosmologies that reflect our condition from the dawn of the species through the present moment. Courses in the Works, Ideas, and Methods aim to illuminate these human products and the ideas they reflect from different disciplinary perspectives and using various cultural frameworks. These courses would teach students the skills that are key to understanding human diversity, the human past, and the challenges we face in the future.

Courses in these categories are currently offered, but interdisciplinary, team-taught versions of them would provide an especially valuable learning experience. Faculty teaching such courses would be drawn from various departments in the humanities, social sciences, and natural sciences. For example, a course on inequality might be taught by two or three faculty from Sociology, Psychology, Economics, History, Government, and Africana; a course on the ethics of genetic engineering by faculty from Molecular Biology and Genetics, Science and Technology Studies, and Philosophy. A course in ancient religion might be taught by faculty from Anthropology, History, Classics, and Near Eastern Studies; and a course on the Enlightenment by faculty from Romance Studies, German Studies, Music, Government, and Art History. We envision that additional general categories for interdisciplinary will be proposed.

The faculty discussions that took place last academic year also generated the recommendation that interdisciplinary courses be classified with an enrollment code that does not tie them to specific departments. The use of a single code would enhance the visibility of interdisciplinary courses, and would provide students with a clear way to find them. The code currently available is AS (“Arts and Sciences”).

Every interdisciplinary course would likely satisfy at least one distribution requirement, with some having the capacity to fulfill a distribution requirement from a choice of two or more categories. However, we do not recommend that these courses be allowed to fulfill more than one distribution requirement simultaneously. Instead, students would be permitted to count such courses towards one distribution requirement only. To avoid the proliferation of courses bearing multiple distribution categories, we recommend a faculty committee (perhaps the Educational Policy Committee) be tasked with monitoring and approving such courses. Interdisciplinary courses fulfilling multiple distribution categories should remain the exception rather than the rule.

Engaged and Applied Learning

Cornell's unique position, as both an Ivy League and land grant institution, provides a foundation for simultaneous enrichment of academic and social benefit through community-engaged learning. Increasingly, our students are looking for ways to learn from and give back to communities, both locally and internationally, in ways that enable them to gain experience and prepare for their careers after Cornell.

At present, roughly one third of A&S students include a community-engaged course in their curriculum while at Cornell. The College has a significant track record of community engagement, one that includes programs such as the Cornell Prison Education Program, courses in which students volunteer in local community groups supporting immigrant residents, and studying the science and culture of climate change in the Mekong Delta. These courses enable students to connect theory and practice and to learn from others to address specific real-world issues and concerns.

Community-engaged research and teaching are high-impact practices that deepen Cornell's commitment to student learning. They provide a rich learning opportunity for students that encompasses collaboration in teams, understanding problems in the context of the needs and interests of affected communities, and learning to communicate across difference. Applied learning promotes lasting, transformative, and equitable learning. Theoretically informed practice invites students to appreciate and grapple with real complexity and has concrete benefits both for college-level learning and for career discernment and preparation. Most importantly, opportunities for applied and community-engaged learning help students to develop empathy, skill, and agency to undertake their commitments through work and lifelong education.

Faculty feedback stressed their desire that students be more engaged with their communities and with the world, and more savvy consumers of news, data, and scientific information. Engaged Cornell provides an opportunity to put classroom knowledge to work in local communities and around the world. We seek to make it possible for all undergraduates in the College of Arts & Sciences to have at least one meaningful community-engaged experience during their time at Cornell; our hope is that the A&S curriculum will also offer many pathways of deepening opportunity for engagement across a four-year career here.

The Engaged Cornell initiative has provided resources, in the form of grants for undergraduates, graduate students, faculty, and staff and consulting and assessment resources for faculty and staff that have enabled the development of new and extant courses that connect Cornell academics with community partners. These include the new "Gateways to Engaged Learning" preparatory course sequence in Anthropology; the new Government-hosted minor in "Crime, Prisons, Education, and Justice," the "Cultures and Communities" opportunity in Latino/a Studies, and "Theater and Social Change," which brings local stories about the impact of climate change to the stage.

We recommend that all students in the College of Arts & Sciences be encouraged to take a community-engaged learning course during their time at Cornell. When appropriate, Engaged Learning courses may satisfy a distribution requirement. We see particular value in creating engaged learning courses that meet the requirements for Human Difference and Global Citizenship.

Data Science

Students in our College are increasingly seeking computer, information, and data science courses as part of their undergraduate degree. They seek to develop computer literacy and statistical analysis skills. The particular challenge for A&S is helping students to connect the skills to the diverse array of disciplines across which they seek to apply them. Our faculty are involved in research and instruction that incorporates data science skills across a wealth of different real-world and academic contexts, spanning humanities, social sciences, physical and biological sciences

At present, our College doesn't have a coherent/clear set of pathways to help students navigate how skills learned in introductory computing and statistical science areas can be connected with studies in their areas of interest. To address this challenge, a joint undergraduate curriculum governance committee, between A&S and CIS, has been formed to develop and oversee a coordinated curriculum framework for undergraduate data science pathways. The committee will look at introductory data science course offerings, both current and potential, to assess how we can meet differentiated needs, based on student preparation and goals. It will also consider potential course pathways that could follow on from gateway courses, to allow students to apply the techniques in different disciplinary areas and coordinate and incorporate inputs across colleges and departments.

Active Learning

Any discussion of the curriculum and curricular innovations has to acknowledge that many of the College's courses, particularly lower-division courses in the natural sciences and empirical social sciences, are large lectures. Funding from an external donor has allowed the College to support departments that teach these large lectures to adopt active learning pedagogy in their classrooms, adapt these strategies for their disciplines and courses, and evaluate their effectiveness. Data from the departments that are in their second or third years of this initiative show that active learning increases student engagement, improves outcomes, and reduces performance gaps between students from different social and economic backgrounds.

We recommend that the College expand the Active Learning Initiative (ALI) to incorporate more departments and more courses within departments. It should also investigate ways to sustain the program in the longer-term. Most of the ALI departments have found that

active learning pedagogies take significant time and resources to develop. They are also most successful when they are accompanied by broader changes in how departments train teaching assistants, evaluate student learning, and reward excellence in undergraduate instruction. These changes require sustained investment and support.

These four areas outlined in curricular innovation follow and interact with our curriculum requirement recommendations as well as the outreach and communication strategies by which our students become familiar with and navigate the curriculum, from matriculation to graduation. By identifying new distribution categories such as Global Citizenship, Human Difference, Science of Society, and Statistics and Data Science, we recommend that the College of Arts and Science stakes the claim that an engaged global citizen has some exposure to human diversity, global issues, and data and evidence. These curricular innovations do not compete with the other areas of the liberal arts and sciences; instead, they complement them.

CONCLUSION AND NEXT STEPS

Over the last two years, the Committee has conducted a detailed examination of our current curriculum and evaluated various scenarios of curricular reform. This final report follows an initial draft proposal, and extensive engagement with faculty, students and other stakeholders', listening and responding to their expressions of values, preferences and guiding principles for a liberal arts and sciences education, and their concerns with the current model.

The Committee concludes, after its deliberations, that our College's undergraduate curriculum must, above all things, serve to drive exploration. The three main themes of the report center on ways to enhance and facilitate this exploration, with an emphasis on: (i) building awareness of the full extent of the college's curriculum through effective navigation, (ii) improving simplicity and clarity in the graduation requirements, and (iii) enabling interdisciplinarity and pedagogical innovation.

The Committee acknowledges and appreciates the challenges that can come with curricular reform and innovation, particularly pertaining to funding and scalability; however, we believe that these modest recommendations are achievable, will remove current barriers to exploration, and better reflect the principles, priorities and strengths of the College.

We ask that the faculty endorse these recommendations and move forward with a formal proposal.