

2019-2020

# FIRST-YEAR ACADEMIC HANDBOOK

UNIVERSITY OF ROCHESTER





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# 2019 STUDENT ORIENTATION STAFF



## ***Victoria Bongard '20***

Victoria, a rising senior, grew up in Virginia, and her family now lives in Indiana. She is a double major in film and media studies and digital media studies with a minor in computer science. She has been making videos since she was six, but when she doesn't have a camera in her hand you can catch her leading campus tours, playing field hockey, working as a peer academic mentor, cheering on Barcelona FC, and eating lots of Ben & Jerry's ice cream. Victoria is returning from a semester in Barcelona and is excited to welcome the newest Yellowjackets to the University of Rochester!



## ***Rafael Ramirez Giron '21***

Rafael is a rising junior from Santa Ana, California, and is pursuing a major in cell and developmental biology. He is originally from Mexico, but his family immigrated to the United States when he was a baby. When he is not busy with classes and work, he volunteers at the hospital, is involved with Student Programming Board (event planning), and, starting this fall, with Class Council. Rafael cannot wait to welcome new Yellowjackets to the University of Rochester community.



## ***Sekelile Mkhabela '21***

Seke, a rising junior international relations and economics major, hails from the lovely Kingdom of eSwatini. In addition to delving into the complexities of politics and money, she likes spending time exploring the city of Rochester, playing (and losing) card games, and being the vice president of Model United Nations club and a curator for TEDxUniversityofRochester. She also serves in the Meridian Society as a tour guide. Seke looks forward to giving the Class of 2023 and transfer students a memorable orientation experience!



## ***Tiffany Nicholas '19, T5 '20***

Tiffany grew up in the Rochester area (you can tell by her love for Wegmans) and is a rising fifth-year student. She's majoring in biomedical engineering, minoring in music and history, and studying gender and the media for her Take Five program. When she's not baking cakes, making bad puns, or watching a Marvel movie, she can probably be found volunteering with her brothers in Alpha Phi Omega, working as a TA for the BME department, or trying not to trip while giving tours on campus. After working with orientation for the past two years, Tiffany is excited to be back again to welcome the newest addition of Yellowjackets to the Rochester family!



## ***Gabija Saginaite '22***

Gabija is an international student who grew up in Lithuania and graduated from high school in Boston. She is majoring in finance with a minor in biology and is considering a minor in ASL. When she is not working at "Grab and Go" or studying at the library (shoutout to iZone!), Gabija likes to hang out with friends, explore the city of Rochester, and, while doing so, find the best places to get food. She is very excited for the new students to join the Rochester community!



## ***Helena Schreder '22***

Helena grew up in Lancaster, Pennsylvania. She is a rising sophomore planning to major in mechanical engineering with a minor in studio arts. When she isn't drawing in her sketchbook or doing math problems, she can be seen spending time with her friends from Gannett 3 or her sisters from Gamma Phi Beta. Helena is excited to help make Rochester a home away from home for transfer students and the Class of 2023!



## ***Brendan Stone '20***

Brendan is a rising senior from Corning, New York, majoring in international relations with a minor in digital media studies. When he's not catching up on schoolwork, he can be seen working for the Athletics Department's Stream Team broadcasting the Yellowjackets' latest games and tournaments, going for a hike with the Outing Club, or working with the 2020 Class Council planning upcoming events. Brendan is excited to show both the class of 2023 and transfer students how passionate students at Rochester are and help them discover the opportunities to pursue passions of their own!

# WELCOME TO THE COLLEGE

The College at the University of Rochester is unlike any other college in the world. Here we believe that your education belongs to you, and that your interests, passions, curiosity, and goals—above all else—should drive your learning. We know as a research faculty that you will do your best work and have the most fun in your studies if you learn what you love and love what you learn.

Experience teaches us that people do not learn in isolation. We learn from others and with others. At Rochester, people learn together by living and working together. Studying with those who share your interests and curiosity helps keep your learning alive. Being challenged by others who ask unexpected questions opens up new interests and passions. The possibilities for learning here are unbounded. The campus offers nearly unlimited opportunities for you—both in and out of class—to sharpen your skills and develop new interests.

Welcome to college. Everything in this *First-Year Student Academic Handbook* is designed to help make your education your own. Have the time of your life!

## The Rochester Curriculum

Three features central to faculty learning are the hallmarks of the Rochester Curriculum: curiosity, competence, and community. With abundant and committed guidance, students plan for broad and free experimentation with ideas and subjects, discover or sharpen their interests, and come to understand their intellectual strengths and weaknesses. Students learn through sustained and integrated study in varied fields about a range of subjects and acquire the complex problem-solving and analytical skills needed for a lifetime of learning. Students pursue at least one major in one of the three great divisions of learning (humanities, social sciences, natural sciences and engineering) and complete at least a cluster in each of the other two areas. The choice of subject matter and the level of concentration (major, minor, cluster) in each division is the student's, but through that choice, students take part in three different intellectual communities and in three different sustained conversations about learning and ideas.

These three different intellectual communities are the academic divisions of the College. Scholars in each division tend to know different things and to know them in different ways.

**The natural sciences and engineering** are concerned with natural phenomena ranging from the nature of numbers and logic to those of the cosmos and our Earth, through those of creature, organ, cell, and gene, and on to those of the fundamental phenomena of energy and existence.

**The social sciences** focus on natural phenomena that involve social interactions, human behavior, and the ways in which individuals create and maintain social groups and shape societies. Social scientists conduct research that is both quantitative and qualitative.

**The humanities** investigate humanity's meaningful past and present through analysis of our symbolic and creative expressions. They explore how individuals and groups define and understand themselves and others with the ultimate goal of learning what it means to be human.

Students need to complete a **major** in one of these three divisions, and unless they choose an additional major or a minor, an authorized "divisional cluster" in each of the other two areas outside the area of the major. The following list of undergraduate degree programs (majors) offered by the College is divided into these three academic divisions:

### NATURAL SCIENCES AND ENGINEERING

Applied Mathematics  
Audio and Music Engineering\*  
Biological Sciences  
• Biochemistry  
• Cell and Developmental Biology  
• Computational Biology  
• Ecology and Evolutionary Biology  
• Microbiology  
• Molecular Genetics  
• Neuroscience  
Biology  
Biomedical Engineering\*  
Brain and Cognitive Sciences  
Chemical Engineering\*  
Chemistry  
Computer Science  
Data Science  
Earth and Environmental Sciences  
• Environmental Science  
• Environmental Studies  
• Geological Sciences  
Electrical and Computer Engineering\*  
Engineering Science  
Engineering and Applied Sciences  
Environmental Health  
Geological Sciences  
Geomechanics  
Mathematics  
Mathematics-Statistics  
Mechanical Engineering\*  
Optical Engineering\*  
Optics\*  
Physics  
Physics and Astronomy  
Statistics

### SOCIAL SCIENCES

Anthropology  
Business  
Economics  
Epidemiology  
Financial Economics  
Health, Behavior and Society  
Health Policy  
History  
International Relations  
Linguistics  
Political Science  
Psychology

### HUMANITIES

American Sign Language  
Art and Art History  
• Art History  
• Studio Arts  
Bioethics  
Dance  
English  
Film and Media Studies  
Modern Languages and Cultures  
• Comparative Literature  
• French  
• German  
• Japanese  
• Russian  
• Spanish  
Music  
Philosophy  
Religion and Classics  
• Classics  
• Religion

### INTERDISCIPLINARY MAJORS

African and African-American Studies  
American Studies  
Archeology, Technology and Historical Structures  
Digital Media Studies  
East Asian Studies  
Gender, Sexuality, and Women's Studies  
Interdepartmental Studies  
Russian Studies

**NOTE: A LIST OF APPROVED MINORS APPEARS ON PAGE 97.**

\*Students in these programs may complete somewhat modified clusters.



**Clusters** are officially authorized sets of related courses comprising at least twelve credit hours (normally equivalent to three courses). Most students find that their interests coincide with some of the more than 250 clusters that appear in the Cluster Search Engine online at [www.rochester.edu/college/ccas/clusters](http://www.rochester.edu/college/ccas/clusters). Students may request unique modifications of these authorized clusters through the sponsoring department and may even propose individualized interdepartmental clusters. Each of the clusters in the Search Engine includes a brief description and the requirements for completion. The database is searchable by course (e.g., BCS 110), by division or department (e.g., music), and by concept (e.g., cognition). You can learn more of what you need to know by clicking “Cluster Policies.”

**The Writing, Speaking, and Argument Program** offers three versions of Reasoning and Writing in the College, WRT 105 (4 credits). The extended version of this same course, WRT 105E (4 credits), and the two-semester version, WRT 105A (2 credits), and WRT 105B (2 credits) have been developed for students needing more support or more time to develop as academic research writers. All versions of WRT 105 grow out of a single course description, but individual sections have unique discipline-specific content and themes designed by each instructor with students’ interests in mind. Students will find a wide range of topics from a variety of disciplines, such as “Creativity, Innovation, and Imagination,” “Disease and Society,” and “Contemporary Social Movements.” Section themes are indicated through subtitles and descriptions, which, along with CRN numbers and section times, are available on the Writing, Speaking, and Argument Program’s web page: <http://writing.rochester.edu/>.

The Writing, Speaking, and Argument Program encourages students to choose sections that interest them, whether this interest grows out of a desire to learn more about a favorite subject or to try something new.

**Primary Writing Requirement:** In addition to completing a major, minor, or cluster in each of the three divisions, students are required to fulfill the Primary Writing Requirement. The Primary Writing Requirement is the College’s first step in drawing students into our community of researchers and writers. Typically, the Primary Writing Requirement is satisfied by passing Reasoning and Writing in the College (WRT 105, WRT 105E, or the combined WRT 105A and WRT 105B) with a grade of “C” or better. To be prepared for the upper-level writing requirement in the majors, students should satisfy the Primary Writing Requirement by the end of the first year of study.

**International students** are encouraged to register for U.S. Life: Customs and Practices (CAS 170) during the fall or spring semester of the first year. The class is limited in size to create an interactive and personalized experience. The innovative curriculum is designed to assist students in their transition to college through the study of American culture and values and successful study practices. Readings and short assignments are supplemented by on- and off-campus field trips, guest speakers, group activities, and discussion of current issues. The course carries two credits and may be combined with four additional full-credit courses.

## Learning across the Divisions

A great deal of the College’s innovative teaching and research takes place outside the confines of traditional departments, divisions, or even schools. As the list of interdisciplinary majors on page 4 shows, students can study new fields that have developed at the crossroads of existing disciplines (see also the list of approved minors on page 100). Cutting-edge work in public health–area studies, digital media studies, business, and other domains requires students to have in-depth knowledge in a blend of science, humanities, and social sciences fields. Sometimes students will take courses from multiple departments in the construction of their major; other times, the work they do in individual courses will represent a variety of disciplines.

Many of the college’s newest majors are interdisciplinary. In digital media studies, for example, they pursue work in computer science, art, optics, and film and media studies. Majors in American studies take courses in the humanities and social sciences in departments such as art history, English, history, and political science. East Asian studies majors work in language, anthropology, literature, and history, whereas audio music engineering requires students to study electrical and computer engineering, math and physics, music theory, and computer science.

In addition, many individual courses take advantage of an interdisciplinary format. In some, students learn how to program computers while studying media history and theory; in others, they study musicianship and the art and science of sound recording.

## Academic Honesty

As first-year students, you are joining a university community committed to the pursuit of excellence in learning, teaching, creativity, and research. Academic honesty is the cornerstone of that academic excellence, as it creates the necessary conditions of mutual trust and open communication that make intellectual inquiry and growth possible. The AS&E Academic Honesty Policy recognizes our shared obligation to promote academic honesty, establishes high standards of academic conduct, and requires each student to meet those standards.

### IN SUMMARY, you will complete for your degree:

- a major with an average grade of C or better;
- a divisional cluster in each of the two divisions outside the area of the major with an average grade of C or better (although you may substitute a second major or a minor for a cluster in either or both of these two divisions);
- the primary writing requirement (normally WRT 105, WRT 105E, or WRT 105A and WRT 105B) with a grade of C or better;
- the upper-level writing requirement (integrated into the requirements for your major);
- a minimum of seven semesters;
- a minimum of 128 credit hours, with an average grade of C or better;
- the College’s Enrollment Policy (for further information, visit [rochester.edu/college/CCAS/AdviserHandbook/enrollment.html](http://rochester.edu/college/CCAS/AdviserHandbook/enrollment.html))

Academic honesty means acting with truthfulness and sincerity in carrying out all aspects of our individual and collaborative work, maintaining ownership over our work, and acknowledging our debt to the work of others. Students should complete their work through their own honest efforts and expect and encourage honesty among their peers. All new students are expected to complete the Academic Honesty tutorial available online before the start of the academic year. To learn more about the academic honesty policy, visit [rochester.edu/college/honesty/](http://rochester.edu/college/honesty/).

## The Humanities Center

The Humanities Center offers a home for any student interested in exploring the human experience across time and place. Located

on the second floor of Rush Rhees Library, the newly constructed center welcomes not only undergraduates in humanities disciplines but also students in any major who are looking for new perspectives, new knowledge, and new interconnections. The center has room for studying, teaching, performing, and socializing as well as for collaborating on all types of projects, including those that use digital technologies for humanistic inquiry.

Undergraduates are welcome to attend lectures, Humanities Project events, and symposia. The center offers information on Meliora Seminars for first-year students and supports undergraduate research with two programs: Meliora Scholars and Humanities Research and Innovation Grants. Join the community of the Humanities Center for great conversation in an environment that fosters great ideas! For a calendar of events, go to [www.sas.rochester.edu/humanities](http://www.sas.rochester.edu/humanities).

# CHOOSING YOUR COURSES

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**Planning for Your First Year:** The Rochester Curriculum is uniquely designed to allow you to own your education. We do not tell you which subjects to study—that choice is fully yours. Here you may safely explore courses of interest and not worry about having enough time to complete your academic program. This is true whether you select a major with 10 required courses or 20. To see how true this is, consider what might be possible if you decide on one of the most time-consuming programs, a BS major in the biological sciences: you'll complete "Reasoning and Writing in the College" and, as required by the major, a maximum of 11 biology courses, two semesters of calculus, four semesters of chemistry, two semesters of physics, and one course in a field related to biology, for a total of 21 courses. This leaves 11 courses for exploration, some of which will lead to fulfilling clusters. Many of you will choose majors with fewer requirements, leaving plenty of time for a cluster of particular interest to grow into a minor or second major.

Beginning on page 12 of this handbook, you'll find advice from each department that will help you select courses that match your interests and skill levels. Your choices will depend on several factors, including your initial ideas about possible majors, your comfort with exploring unknown subjects (give it a try!), departmental placement recommendations, and course availability (although this is not typically a problem). Here are some opportunities to consider as you read through this handbook and jot down courses you might take:

*Small, interactive courses*, which allow you to work closely with faculty and meet other students with similar interests. We strongly recommend taking at least one small course your first semester. WRT 105, CAS 142, one of the Meliora seminars offered specifically for first-year students, and language courses are examples of small courses, though there are many others as well.

*Interesting courses outside potential major(s)*, which offer a gateway to new interests. Read through the course descriptions in this handbook and choose three that you find especially interesting. We challenge you to take at least one your first semester. (You have plenty of time!)

*Courses for potential major(s)*, which allow you to delve into your area(s) of interest. Be sure to read "Departmental Advice for First-Year Students" included in this handbook to identify the courses you will need to take during your first year, along with those that might be postponed.

*Courses that coincide with your academic strengths*, which provide a boost of confidence while allowing you to delve deeper into an area of study.

Most importantly, your choices should grow out of your interests, your curiosity, and your goals.

When selecting your courses, keep in mind that some are offered only once each academic year. While MTH 141 and 161 are offered each semester, courses such as CHM 131 and most introductory (101) language courses are offered only in the fall semester.

**Academic Advising during Your First Year:** During the summer prior to your arrival on campus, you will be assigned to an *undergraduate advisor*. Undergraduate advisors are faculty and staff who assist students in developing a preliminary academic plan, encourage exploration of the Rochester Curriculum, introduce students to academic opportunities, and help students build relationships with other campus offices and programs.

Undergraduate advisors help you navigate your college lives; they serve as guides as you begin your college journey; and they assist you in making good academic decisions. Undergraduate advisors recognize that many students arrive at college somewhat uncertain about their academic futures. They also understand that many other students arrive at college feeling very certain about their plans for their first year. Both of these scenarios are typical, and both are completely OK!

You can expect to meet with your undergraduate advisor several times during Orientation and once classes are under way, it is likely that you will meet several times each semester during your first year. Your undergraduate advisor is the person to speak with when you have questions about choosing classes and clusters, getting involved on campus, interacting with your professors and teaching assistants, and academic support services such as tutoring. As your guide to college life at Rochester, your undergraduate advisor will refer you to a faculty member in a program or department for detailed information about your prospective major. If you have a specific question about an academic policy (e.g., whether you might be able to take an additional course in an upcoming semester), your undergraduate advisor will recommend that you meet with a professional advisor in the College Center for Advising Services.

**The International Student Mentor (ISM) Program** at the University of Rochester fosters meaningful interactions between current students and incoming international first-year, transfer, and exchange students. ISMs contact incoming international students in June to assist them in their journey to the University of Rochester. ISMs answer questions about academics, cocurriculars, and what life is like on campus and in the city of Rochester and surrounding community. ISMs also coordinate events throughout the fall semester to help international students connect with their new home. For more information, visit the program’s website at [www.rochester.edu/College/orientation/international/mentors.html](http://www.rochester.edu/College/orientation/international/mentors.html).

**College Peer Advisors** help students make relevant connections to academic departments on campus. Many students find the opportunity to meet with a peer advisor to be helpful in getting answers to questions about a prospective major or minor, research opportunities, classes, and study abroad. To meet the peer advisors, visit <https://rochester.edu/college/ccas/peer-advisors/>.

Many other advising resources exist as well, including First Year Fellows, advisors in the Gwen M. Greene Center for Career Education and Connections, and study skills consultants, to name just a few.

At Rochester you will have an entire community of advisors.

**Academic Advising during Your Second Year (and Beyond):**

Upon official declaration of a major, usually at the end of the sophomore year, you will be assigned a *major advisor*. Students intending

to major in engineering can expect to stay with the same advisor assigned to them in their first year. Major advisors (typically faculty members) provide critical guidance in helping students understand course content and classroom expectations, identify opportunities for research and career development, and gain a deeper appreciation of their chosen academic discipline.

To make the most of your intellectual journey at Rochester, we encourage you to continue to build relationships with peers, staff, and faculty throughout your undergraduate years. For some students, the undergraduate advisor will continue to be an important source of information and support until graduation. Other students will find that the relationships they develop with faculty and staff later in their college career will be more frequently accessed sources of information. In both cases, it is important to recognize that Rochester has a variety of resources to support your academic journey; by seeking out conversations with others, you will enrich your own experience and develop a supportive and influential community of advisors.

**Connecting Courses and Careers:** As you decide which courses to take, consider the connections these courses have to your interests and professional goals. Whether you are exploring career options or have one in mind or need to fulfill prerequisite courses, your academics will play a key role in the development of the knowledge and skills needed for your future. See page 92 for more information on connecting coursework and careers and how the Gwen M. Greene Center for Career Education and Connections can assist you in your exploration.

**Courses I am interested in:**


**Courses for the major(s) I am currently considering:** (Spend some time reading the departmental advice for first-year students for the major(s) you’re contemplating. List the courses you’ll need to take during your first year.)


**Advanced Placement and International Baccalaureate Exams:** AP and IB award criteria, as you may have noticed, appear with the departmental information. Students are notified of credit by the College Center for Advising Services. Those wishing to discuss either AP or IB credit should contact that office. If you have taken any AP or IB courses, please list the subject and grade that you received on each exam (if known). Then, look up and record the placement information below.

AP or IB Exam	Score	Rochester Placement

(Note: The records of students with AP credit that is contingent upon the completion of a Rochester course are reviewed each summer so that credit may be awarded appropriately.)



**College-level transfer credit:** For the sake of coherence and uniformity of instruction, the College prefers that its entering first-year students take all their courses, basic and advanced, from its own faculty as much as possible. *With the exception of CEEB Advanced Placement and International Baccalaureate work, the College does not recognize nor grant college credit for secondary school coursework or for courses taught in a secondary school by the secondary school's own faculty for college credit.*

Credit may be granted to entering students for prior coursework taught on the campus of an accredited college or university and completed with a grade of "C" or higher. Upon receipt of the official transcript, the coursework will be evaluated to determine if it is equivalent in level and/or content to coursework at the University of Rochester. Please note that transfer credit for a writing course does not, in itself, satisfy the primary writing requirement; see Course Placement Methods, Primary Writing Requirement and Placement, page 9. Note as well that students may apply transfer credit toward their graduation requirements. However, the College's enrollment policy does not permit students to accelerate their graduation by more than one semester.

Students should have an official transcript sent to the College Center for Advising Services, 312 Lattimore Hall, University of Rochester, P.O. Box 270402, Rochester, NY 14627-0402. Please indicate below any anticipated college-level transfer credit.

**Name of college/university where course was taken**

**Credit for courses taken at the University of Rochester:**

Students who have taken credit-bearing courses here while in high school, through the Taste of College program or otherwise, should be aware of the following. Grades for these courses will be factored into the cumulative grade point average, and credit will count toward undergraduate degree requirements. Students have the option of requesting that these courses be treated as if they were transfer courses, in which case the grade will be removed from the average, and credit will be counted toward degree requirements as long as the grade was a "C" or better. Petitions should be submitted to the College Center for Advising Services. If more than one course was completed, students may not "selectively" choose which courses will be factored into the cumulative grade point average.

**College Enrollment Policy:** To ensure that they receive the full benefit of the residential college experience, Rochester students who enroll as first-year students are expected to maintain full-time enrollment during the fall or spring semesters for no less than seven semesters. Semesters spent on University of Rochester study abroad academic year programs are considered the equivalent of full-time semesters in residence. Students with questions about early graduation should discuss their plans with an advisor in the College Center for Advising Services.

**Course(s) taken**

Name of college/university where course was taken	Course(s) taken

**Course Placement Methods**

**Biology**

**Which section is right for you?**

**BIO 110 Principles of Biology I with Lab (with section instructor Michael Clark)**

A course designed for students who have some biology background. Ideally suited for students who have taken AP (IB) biology but did not score a 4 or 6 on the respective tests. However, a confident student who has taken multiple AP courses in other disciplines should also consider this course. This course is open to upperclass students.

**BIO 110L Principles of Biology I with Lab (with section instructor Thomas Eickbush)**

A first-year-student-only course designed for those with a little biological background. This course is most beneficial to students who took biology during their first year or sophomore year of high school. All students will take part in a weekly study group run by a graduate student mentor. A permission code is required to register for this course and can be obtained from the student's first-year advisor. If students have questions, they should contact Professor Eickbush in person Friday morning at the "Open House" or Friday afternoon at his office (HH334a).

**BIO 112L Perspectives in Biology I with Lab (with section instructor David Goldfarb)**

A first-year-student course designed for confident students with strong biology backgrounds. This typically means a score of 4 or 5 on the AP Biology test or an IB score of at least 6.

**Key Points**

**BIO 110 (both sections) and BIO 112**

- are appropriate for premedical school tracks and prepare students for upper-level biology courses (non-premed students who intend to major in the social sciences or humanities should register for BIO 101 Genes, Germs, and Genomics)
- require concurrent enrollment in chemistry (e.g., CHM 131 or equivalent)
- require laboratory attendance every other week (lab included in 4-credit course; see instructions for lab sign-up in online registration course description)
- require workshop attendance (see instructions for workshop sign-up in online registration course description).

Students with questions about introductory biology courses should visit the biology table at the Open House during Orientation week to talk with the instructors.

### Chemistry

Students interested in chemistry who do not have AP credit should select CHM 131. Students who have received a 4 or 5 on the AP exam are entitled to credit for CHM 131 and have several options available. Students may take the chemistry course in organic chemistry, CHM 171/173, or they may accept the credit and not take chemistry in the fall semester, with subsequent enrollment in CHM 132 in the spring semester, or they may waive the credit and enroll in CHM 131.

The department expects that some students will select each of these options, depending on their preparation in chemistry and their future interests.

### Primary Writing Requirement and Placement

All students at the University of Rochester, whether incoming first-year students or transfers, must satisfy the Primary Writing Requirement. The majority of students fulfill the requirement by earning a “C” or better in WRT 105, Reasoning and Writing in the College, or WRT 105E or WRT 105A and B, versions of 105 chosen by students who need more support to meet the demands of college-level writing. Students who believe that they are already proficient college writers may petition to substitute a University of Rochester writing-intensive course for WRT 105. The substitute course may not also be used to fulfill the Upper-Level Writing Requirement. Transfer students who have completed a WRT 105 equivalent at another institution and received a “B” or better may petition to use this course to satisfy the Primary Writing Requirement. For more information on satisfying the Primary Writing Requirement, including instructions on how to access the Writing Placement Survey, please refer to <http://writing.rochester.edu/undergraduate/index.html>.

Students admitted to the College through the English for Academic Purposes Program fulfill the requirement by earning a grade of “C” or higher in WRT 103, EAPP Critical Reading, Reasoning, and Writing, and WRT 104, EAPP Research, Reading, and Writing. For more information on EAPP placement and courses, please refer to <http://writing.rochester.edu/eapp/index.html>.

### Foreign Languages

Modern language students with no previous exposure to a language should begin with the 101 course. Students with previous exposure to a language should check the language placement page provided through online orientation forms for instructions about taking a placement exam. For languages for which there is no online exam available, students should contact an advisor in the Department of Modern Languages and Cultures (Italian, Japanese, Korean, or Portuguese), the Skalny Center (Polish), or the Department of Religion and Classics (Arabic, Greek, Hebrew, or Latin) for placement at the appropriate level. Students are not permitted to register for or receive credit for a particular language course if they have already achieved proficiency at the level of that course. For courses 101–200, students are not permitted to register for a lower-numbered course after successfully completing a higher-numbered course. While students are not allowed to place themselves, every effort is made to ensure that students are placed in courses that are appropriate to their background and abilities.

### Mathematics

One of the primary factors conducive to success in mathematics is placement in the appropriate course. The Department of Mathematics uses

a combination of SAT and ACT scores, AP calculus exam scores, and high school records to place students. Advanced Placement credit rules take precedence over SATs and ACTs. See the mathematics section of this handbook for more details on AP scores and placement.

For students placed in either MTH 140 or MTH 141 who wish to enroll in a higher course, there will be a placement test offered at the beginning of the semester. For more information, see the placement web page [sas.rochester.edu/mth/undergraduate/handbook/placement.html](http://sas.rochester.edu/mth/undergraduate/handbook/placement.html) and the mathematics section of this handbook. In case of discrepancy or questions, students are encouraged to speak with a representative of the mathematics department at the academic open house during Orientation.

### Music

Students interested in registering for a music theory course should take the Theory Placement Exam given during Orientation. Results will guide the music faculty in determining appropriate placement into MUR 110 or MUR 111. Students who received a score of 5 on the Music Theory AP test should begin with MUR 111 and do not need to take the placement exam.

### Psychology

A score of 4 or 5 on the AP psychology test will result in 4.0 semester hours of credit and waiving of the requirement for Introduction to Psychology. To earn transfer credit, an introductory course must be taught at a college by regular college faculty. Courses taught in the high school will not be granted transfer credit.

## Putting It All Together

Review what you’ve done so far and make a list here of the courses you want to consider this fall. *Then, using the online Fall 2019 Course Schedule available at [cdcs.ur.rochester.edu/](http://cdcs.ur.rochester.edu/) together with the Course Planning Form*, begin building a few possible schedules that appeal to you, both in content and in structure. We recommend that you use a pencil, so you can easily change your mind and your schedule. Then, when you are ready, complete the online Course Planning Form and submit it with your other Orientation forms. (Remember, there will be many opportunities to discuss, clarify, and change courses at Orientation, but if you want help sooner, give us a call.) *Most students register for four full-credit courses during their first semester, typically totaling 16–19 credits. In addition, first-semester students may choose to register for up to three additional credits of coursework.*

### Fall 2019

#### Preferred courses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



**Other courses that interest you:**

1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____

If you have any questions at all, please feel free to contact the College Center for Advising Services at (585) 275-2354, Monday through Friday, 9 a.m. to 5 p.m. or email us at [cascas@rochester.edu](mailto:cascas@rochester.edu).

An advisor will be happy to answer any questions you may have. Please refer to our website at [rochester.edu/college/ccas](http://rochester.edu/college/ccas).

# WHAT WILL YOU HAVE TIME FOR?

Once in college, you may at first feel that you have an extraordinary amount of time on a day-to-day basis. In fact, you do have a great deal of unscheduled time. The challenge is filling that schedule in a balanced and productive way. Just what will you have time for?

**A. Class time:** Please consider the amount of time that your coursework will require.

You will be in class an average of 12–18 hours per week. For every one hour in class, expect to spend two to three hours reading, reviewing lecture notes, doing library or lab-based research, writing essays or lab reports, working on problems, etc. That equals a time commitment of 36–72 hours per week—more than a full-time job!

**B. Co- and extracurricular activities:** Involvement in activities such as the arts, athletics, clubs, and cultural activities is an important part of a college experience. Look at the list available online at the Campus Community Connection ([ccc.rochester.edu](http://ccc.rochester.edu)) of more than 230 clubs and organizations and make a note of some activities that interest you. You'll be able to log in with your NetID and password beginning in August. You should also plan to attend the Student Activities Fair taking place on the first Friday of classes.

**C. Additional time commitments:** How many hours a week do you think you will spend in the following areas during your first semester?

paid employment \_\_\_\_\_

volunteering \_\_\_\_\_

socializing \_\_\_\_\_

commuting \_\_\_\_\_

family obligations \_\_\_\_\_

sleeping \_\_\_\_\_

eating \_\_\_\_\_

other \_\_\_\_\_

There are 168 hours in a week. How many have you accounted for?

A. Study and class \_\_\_\_\_

B. Co- and extracurricular \_\_\_\_\_

C. Additional \_\_\_\_\_

Total Time Commitments \_\_\_\_\_

(If you think you might be overwhelmed, we are here to help you. Assistance is available from your undergraduate advisor and, among other campus resources, the people in the College Center for Advising Services and the Center for Excellence in Teaching and Learning.)

## Your Orientation Materials and Questions

Now you're ready to complete and submit your orientation materials. All forms and information are available online at <https://learn.rochester.edu>. If you are having difficulties accessing the forms online, please contact the Orientation office at (585) 275-4414 or email [orientation@rochester.edu](mailto:orientation@rochester.edu). We are happy to be of help to welcome you to the University.

# MELIORA SEMINARS

Attending college gives students the opportunity to take courses that address important issues and explore new disciplines that are not typically covered in high school. At Rochester, Meliora Seminars are small, selective courses for first-year students that allow study of fascinating questions about being human in a complex world: What is the nature of democracy? How do we communicate with one another? What is love? What is justice? How have artists and filmmakers addressed the problem of climate change? The goal is to create a collaborative and rich intellectual experience for students beginning their academic careers Rochester. The seminars are designed for first-year students and do not presume prior experience in the field.

Each Meliora Seminar is unique, but common features include

- explicit attention to the relevance of course material to contemporary social issues
- community engagement through on- or off-campus dialogue with individuals or groups working on issues addressed in the seminars
- reading and discussion in small classes of 12–15 students

Meliora Seminars count as regular, graded 4-credit courses and can be used in clusters, minors, and majors. In collaboration with the College's Writing, Speaking and Argument program, the seminars are also preapproved as acceptable alternatives for students who petition out of the WRT 105 requirement.

## Course Descriptions

### Fall 2019

**CLA 167M/ATHS 167M Who Owns the Past?** (Instructor: Elizabeth Colantoni) As the recent destruction of the archaeological site of Palmyra in Syria and the removal of Confederate statues in New Orleans show, historical objects, monuments, and sites are not relegated to the past; instead, they are the building blocks of modern identities and politics. This course examines current issues concerning the ownership, protection, and presentation of cultural heritage, including particularly archaeological and historical objects, monuments, and sites. The course begins with introductory information about archaeology, museum studies, and cultural heritage law. We then consider such questions as: Who decides what cultural heritage is significant? Who should determine how archaeological and historical sites are presented to the public? Should private individuals be allowed to purchase objects of historical or archaeological significance? What moral and ethical responsibilities do museums have? Who owns cultural objects taken in the context of warfare?

**EHU 167M Climate Futures.** (Instructor: Leila Nadir) Glacier ruins, extreme weather, rising sea levels, an ice age, and no polar bears. As artists, writers, filmmakers, and journalists work to make the often-imperceptible transformations wrought by climate change visible to the public, they deploy imagery, narratives, frames, and aesthetic strategies. Through studies of literature, film, art, and pop culture, this course examines visions of a future shaped by climate change. Topics include philosophical approaches to the Anthro-

cene (a new geologic era proposed by scientists), strategies deployed by documentary and Hollywood filmmakers, and new works of "climate fiction." A central concern of this course is the relationship between science and the humanities in understanding the environment. What are the roles of memory and imagination in the struggle to deal with the warming of Earth? Can the humanities save our planet? If climate change is unstoppable, how do we imagine what comes next?

### Spring 2020

**REL 167M Love and Justice.** (Instructor: Josh Dubler) Speaking in the tradition of Martin Luther King, activist-scholar Cornel West likes to say that "justice is what love looks like in public." It feels encouraging to see love and justice as complementary facets of the same ethical impulse, but does this claim check out? If "all is fair in love and war," then love would appear to sometimes lend itself to more brutal outcomes, and if "justice is blind," then whatever love might animate justice must necessarily be tempered by more dispassionate forces. In intimate dialogue with touchstones of Western philosophy, literature, and cinema, this seminar critically explores the nature of love, the nature of justice, and the tangled relationship between them.

## How to Apply

It is necessary to apply and submit a statement describing your interest in the course in order to be selected. If selected, you are guaranteed registration in that course.

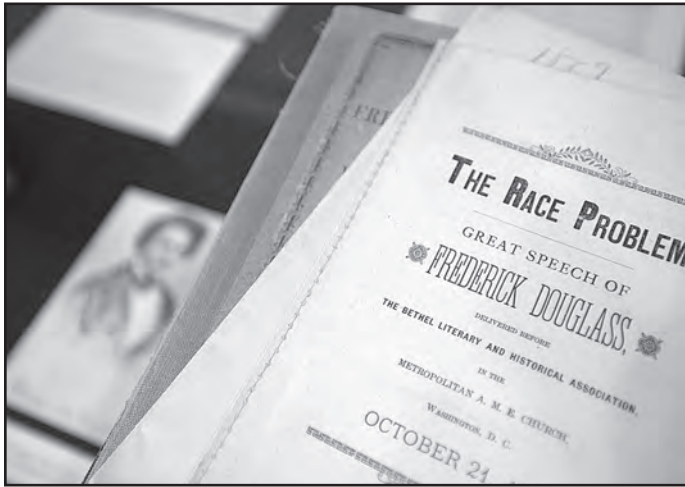
The application is available online at [rochester.edu/college/CCAS/undergraduate/opportunities/meliora-seminars.html](http://rochester.edu/college/CCAS/undergraduate/opportunities/meliora-seminars.html). Sign in with your NetID and password and then follow the instructions in the Class of 2023 Organization located there. Applications are due by July 26, 2019; selected students will be notified no later than August 16, 2019.

*Please email [collegedean@ur.rochester.edu](mailto:collegedean@ur.rochester.edu) with any questions.*



# UNDERGRADUATE PROGRAMS

## AFRICAN AND AFRICAN-AMERICAN STUDIES



*“Conscience is to the individual soul and to society what the law of gravitation is to the universe.”*

—Frederick Douglass  
Rochester, New York (1850)

### Information about the Program

The Frederick Douglass Institute for African and African-American Studies sponsors programs of teaching and research at the undergraduate level. As part of the College, the institute has a broad mandate in undergraduate education, advanced research, and scholarly exchange within the University community and beyond; it is the University’s focal point for African and African-American studies, a scholarly field that speaks uniquely to the issues of diversity, diaspora, citizenship, race, and identity that continue to be among the most important faced by our nation and our world.

The undergraduate concentration in African and African-American studies (AAS) provides an interdisciplinary program of studies that includes a variety of disciplinary approaches to the study of people of African descent in the Atlantic world, including the United States, the Caribbean, Latin America, Europe, and the African continent. Courses are cross-listed in anthropology, economics, English, history, modern languages and cultures, political science, religion and classics, art history, women’s studies, dance, and chemical engineering. Students follow a rigorous and closely monitored concentration designed to provide both broad exposure to and in-depth knowledge of the field.

In order to further help AAS majors get a more intellectually rewarding experience, the AAS concentration has three tracks: Race and Social Issues; Visual, Performing, and Literary Arts; and Slavery and Its Legacies. The AAS concentration appeals to students with primary interests in African and African-American studies as well as students working in more traditional, discipline-specific majors who find it an attractive, complementary option. Students majoring in engineering or the natural sciences may find a concentration in African and African-American studies an enriching opportunity as well.

### Clusters

#### African-American Politics (S1AAS002)

This cluster is designed to deepen the knowledge of students concerning the African and African-American aspects of political science.

#### Aspects of History (S1AAS001)

This cluster is designed to help deepen the knowledge of students concerning African and African-American aspects of the discipline of history.

#### Economics and the African Diaspora (S1AAS003)

This cluster has been constructed to help deepen the knowledge of students concerning theoretical and empirical issues of development over time in economics, with special reference to African and African-American economic development.

#### Global and African Diasporic Studies (S1AAS005)

An exploration of topics and issues that are relevant to the knowledge of Africa and the African Diaspora (defined as peoples who can claim Africa as an important reference in their genealogy). This cluster emphasizes approaches that bridge existing gaps among different cultures, communities, and countries that make up the African Diaspora.

#### Race and Social Issues (S1AAS004)

This cluster looks at issues from a double racial and social approach, emphasizing the need to consider race and class status as fundamental reading parameters in exploring texts, films, and cultures.

#### Representation and Leadership (S1AAS006)

This cluster explores emblematic figures who inspire social and political movements in the United States, Africa, and the African Diaspora.

#### Visual and Literary Arts of the Diaspora (H1AAS001)

This cluster seeks to educate students about the significance of visual arts and literature in the lived experience of the African Diaspora.

**Note:** Unless otherwise noted, all clusters require at least 12 credits.

## Courses

Definitive course listings are published before each semester.

Courses listed here carry 4 credit hours unless otherwise noted. The following are some of the recent or planned offerings.

**AAS 123 Music of Black Americans.** This course focuses on the development of African-American music from the 19th century through the latter part of the 20th century. We study how African-American music can be used as a lens through which to understand the black American experience and the social and political landscape of American society as a whole. Historical, social, economic, and other factors of various black American music genres are examined to help understand how African Americans constructed identity and interpreted the world around them. We also discuss the performative aspects of these genres in order to understand how black music artists used their bodies and asserted their agency through

performance on stage. Genres explored include the 19th-century spiritual, blues, gospel, jazz, early rock and roll, soul, funk, rhythm and blues, and hip hop, among others. Same as MUR 123.

**AAS 141 African-American History I to 1900.** This course focuses on the cultural process of “Americanization” as Africans became African Americans and their struggle for self-expression and full freedom—family stability, education, economic, political, and social rights. Using several African-American autobiographies, the goal is to produce an accurate account of black life in America through 1900. Same as HIS 170.

**AAS 147 Gospel Music in America.** We examine the historical development of gospel music, beginning with 19th-century slave spirituals and ending with an examination of 21st-century gospel music practices. Throughout this course, we attempt to answer the following questions: What is gospel music—how are the parameters of the genre defined? How has gospel music participated in constructions of black identity and spiritual formation? How has the sound and presentation of gospel music evolved, i.e., instrumentation, vocal aesthetic, performance persona, and technique? Lectures and discussions also highlight some of the perpetually controversial tensions that have come to define gospel music history and culture. Such tensions involve the commercialization of gospel music, the ambiguity of lyrical meaning, gospel music’s flirtations with sensuality and sexuality, and debates about what constitutes “authentic” gospel music. Same as MUR 147.

**AAS 151 The Blues.** The course is about the history and influence of the music known as “the Blues.” The course covers development of the blues from the earliest practitioners to recent developments. Same as REL 151. (Spring)

**AAS 168 West African Drumming Advanced.** At least one semester of previous enrollment in the Introduction to West African Percussion Ensemble. In this course, students work on expanding their repertory of rhythms from Guinea, West Africa, and on improving their playing technique on the djembe, dunun, sangban, and kenkeni. In particular, we concentrate on learning extended solo sequences for the djembe and more advanced arrangements played on the dunun, sangban, and kenkeni. Students also work on developing skills specific to performance, adding choreographed onstage movement to complement their drumming. Prerequisite: at least one semester of previous enrollment in the Introduction to West African Percussion Ensemble. Same as MUR 168. (Fall)

**AAS 200 Cultural Politics of Prison Towns.** Rochester sits in one of the world’s most explicitly carceral landscapes, with more than a dozen state prisons within a 90-minute drive. This co-taught course is a collaborative ethnographic research project designed to examine how the presence of prisons in towns around Rochester reflects and shapes the political, economic, and cultural lives of those who live in the region. Students are introduced to methods and practices of ethnography and conduct firsthand research on the cultural politics of prison towns. Through assigned reading, students learn about the history, sociology, and cultural logics of Rochester and the wider region and of mass incarceration. What does a prison mean for a person living near one? How does the presence of prisons shape people’s notions of justice, citizenship, and punishment? How do these nearby but largely invisible institutions

shape the ways that we live in Rochester? Recommended prior courses: Introduction to Cultural Anthropology or Incarceration Nation. Same as ANT 233, REL 230.

**AAS 210 Ngoma: Drumming, Dance, and Ritual in Southern Africa.** Throughout much of southern Africa, the word *ngoma* means drum. It also refers to specific musical styles that combine drumming, dance, and song. Finally, there is often a ritual dimension to ngoma, which is used in ceremonies focused around individual and social healing. In this class, students bring ngoma alive by learning to perform various Zimbabwean ngoma genres, with the option of specializing in either drumming or dance. Through video clips, audio recordings, photos, and articles, we also learn to understand ngoma within a larger cultural framework. Same as DAN 212, MUR 210, MUR 410.

**AAS 216 Topics in African and African-American Life and Culture.** The primary goal of this course is to provide an introduction to the interdisciplinary approach to the study of issues in African and African-American life and culture. Students attend talks given by visiting speakers, meet, discuss, and respond to issues raised. (Spring)

**AAS 222 Music, Ethnography, and HIV/AIDS.** Addressing the devastating effects of HIV/AIDS in the United States, United Kingdom, Tanzania, Zimbabwe, Uganda, Haiti, and elsewhere, this uniquely interdisciplinary course incorporates insights from the fields of public health, medical anthropology, and ethnomusicology. Studying the HIV/AIDS epidemic through the lens of musical expression, we ask how individuals and communities affected by HIV/AIDS have mobilized musical sound in response to the disease. Topics addressed within the class include musical representations of HIV/AIDS within queer communities; the use of music in public health campaigns to raise awareness about the disease; and the mobilization of musical performance within grassroots support groups for individuals affected by HIV/AIDS. (Spring)

**AAS 228 Race and Ethnic Politics.** In this course, we examine the key role played by race and ethnicity across various facets of American political life. We explore the distinct political and social identities of African Americans, Latinos, Asian Americans, and others and how these identities translate into contrasting political beliefs and different political actions. Other topics include the interaction between race and ethnicity and employment, health policy, access to criminal justice, and educational inequalities. Readings draw upon political science, law, economics, sociology, and public health.

**AAS 231 African American Drama.** As literary and visual art, plays provide some of the most potent content in all of the arts, to which readers have nearly unmediated access. This course explores the history of playwriting and dramatic performance as creative outlets for artists of African descent. The course surveys the tradition of African-American theater, paying particular attention to the formal aspects of drama and covering a range of historical and thematic contexts, including slavery, social protest, interracial relations, intraracial differences (of class, gender, and sexuality), and contemporary attitudes toward African-American history. Featured playwrights include James Baldwin, Amiri Baraka, Lorraine Hansberry, Langston Hughes, Zora Neale Hurston, Suzan-Lori Parks,



Ntozake Shange, Anna Deavere Smith, August Wilson, George C. Wolfe, and others. Students are evaluated on class participation, weekly reading responses, and two formal papers. Same as ENG 228. (Spring)

**AAS 240 Corruption and the Global Economy in Historical Perspective.** This junior seminar offers students the opportunity to research and discuss the operation and consequences of widespread corruption in the global economy and the complex historical processes—economic, social, and political—that help to explain the phenomenon. To make the seminar a well-focused course, discussion focuses on country-specific case studies (with about three selected individuals in each country) that help to demonstrate the general pattern of causes and effects. A major issue to consider, among other things, is the role of cutthroat competition among global corporations and the effects of their corrupt activities on quality of governance. Same as ECO 257, HIS 209.

**AAS 244 Mutilated Bodies, Mutilated Discourse.** “Transnational sisterhood” or cultural imperialism? Legitimate ritualized practice or outdated violent ritual? Genital cutting, female circumcision, female genital surgery? The controversy over this practice already begins with the act of its naming. If there seems to be a consensus about the physical violence imposed on the female body, why is it that western feminist discourse is suspected of perpetuating the mutilation African voices? This course seeks to provide an understanding of the context in which a fragmented “transnational sisterhood” allows for a proliferation of mutilated discourses on mutilated postcolonial bodies. Readings and films include Alice Walker (Warrior Marks), Florence Ayissi Fauziya Kassindja (Do They Hear You When You Cry), Maryse Conde, and more critical and theoretical readings from African, French, and North American authors. In English. Same as FR 243. (Fall)

**AAS 246 Cry Freedom.** The principal ideas of various liberation theologians—Latin American, Asian, African, Afro-American, and feminist. We also examine the social worlds in which they think and write, thus trying to see the connection between their ideas and the social environments they want to liberate. Same as REL 234. (Fall)

**AAS 253 Economics of Discrimination.** Economic development of African Americans during the 20th century, with an examination of the economics of discrimination. Same as HIS 253 and AAS 253.

**AAS 254 West African Dance Forms I.** The objective of the course is to give students an experience in West African dance. We both dance and research the historical development of performing and cultural arts in postcolonial Ghana and Guinea. These cultural practices stem from a rich history pertaining to environment, identity, and crosscultural perspectives. Aesthetic qualities of African dance are explored through video, readings, and performance. This course culminates in a final departmental showing that is choreographed during class. Same as DAN 181. (Fall)

**AAS 268 History of White Supremacy.** The central theme of American history is the problem of race. At the heart of the race problem in America is the white supremacy ideology. Pre-modern concepts of human distinctions typically rested on group membership and coalesced around notable differences such as religion, ethnicity, military prowess, and color but without anything resembling an articulated racial ideology. In the United States, the historically

constructed ideology of White Supremacy provided an intellectual foundation for a social and political system based on white privilege and entitlement. Same as HIS 267, HIS 267W.

For more information, go to [sas.rochester.edu/aas/](http://sas.rochester.edu/aas/).

## AMERICAN SIGN LANGUAGE



*“Without diversity of culture, language, and different ways of seeing the world, we would never have learned what we now know about the different ways that humans live. The linguistic and social lives of deaf people have provided us with unique and valuable ways of exploring the vast potential for human language and culture.”*

—Padden and Humphries  
*Inside Deaf Culture* (2005)

### Information about the Department

American Sign Language (ASL) is the native language of many Deaf Americans. It is a natural language that is at the core of a cultural and literary tradition. As a distinctive language, the study of ASL raises many important scientific questions about the true nature of all human languages.

The ASL program offers a major and a minor in ASL, with courses in its literature and historical tradition as well as in the linguistics and psycholinguistics of signed and spoken languages. The BA degree in ASL provides an excellent educational foundation for diverse careers or for graduate study in a wide range of fields, including linguistic research, medicine, counseling, government administration, community service, deaf education, and interpreting.

Rochester’s large Deaf community offers students many opportunities to learn and use ASL outside of the classroom. Students can participate in the University of Rochester student-run ASL Club activities and attend theatrical events and lectures in the Rochester community.

### Departmental Advice for First-Year Students

Students planning to major in ASL should take ASL 101 and 102 in their first year, followed by ASL 105 and 106 in their sophomore year. As the ASL 106 class level is the prerequisite for the 200-level classes, the sooner a student begins taking ASL classes, the better. One or two elective classes, such as LIN 110, should also be completed in the first two years. We recommend taking ASL language courses in a continuous sequence, because a semester without using ASL can weaken students' signing skills, making it difficult to advance to the next level.

### Placement for Students with Existing ASL Skills

Students entering the program who have previously studied ASL should contact the ASL Program Office (273-5165, guillaume.chastel@rochester.edu, or asl@rochester.edu) to set up an ASL skills evaluation. This is an informal meeting with one of our senior lecturers, who will assess your language skills and recommend the class that will best fit your needs.

### Clusters

The ASL program's most popular cluster is Humanities Cluster H1ASL001, Basic Proficiency in American Sign Language, which includes ASL 101, Beginning ASL I; ASL 102, Beginning ASL II; and ASL 105, Intermediate ASL I.

*The ASL program offers two other clusters that require advanced ASL skills.*

## Courses

**ASL 105 Intermediate American Sign Language I.** The third in a sequence of courses, this course focuses on further development of conversational skills in ASL. Students acquire and expand different conversational strategies and increase ASL vocabulary. Grammatical principles and functions are emphasized. Appropriate cultural behaviors and conversational regulators in ASL continue to be an important part of class. Information on Deaf Culture/history is expanded. Experience with the local Deaf community is required. Prerequisite: ASL 102 in the immediately preceding semester or permission of the instructor. (Fall, Spring)

**ASL 106 Intermediate American Sign Language II.** The fourth in a sequence of courses, this course focuses on further development of conversational and narrative skills in ASL. Students learn and expand different conversational strategies and increase ASL vocabulary. An introduction to analysis of grammatical principles and functions is included. Appropriate cultural behaviors and conversational regulators in ASL continue to be an important part of class. Experience with the local Deaf community is required. Prerequisite: ASL 105 with a grade of B or better in the immediately preceding semester or permission of the instructor. (Fall, Spring)

**ASL 202 History and Culture of American Deaf Community.** An overview of various aspects of American Deaf culture, including descriptions of deafness, Deaf history, education, art and sports allows students to explore and discuss issues facing the Deaf community. Contrasting a Deaf cultural view with the majority medical view is discussed. Analysis of the local Deaf community is required.

Prerequisite: ASL 105 with a grade of B or better in the immediately preceding semester or permission of the instructor. (Fall)

**ASL 203 Advanced ASL.** The fifth in a sequence of courses, this course is designed for the advanced study of ASL. It provides students with the opportunity to increase their ASL expressive competence and to use ASL in a variety of discourse and narrative settings. Skills to be developed are storytelling, semantic awareness analysis, in-depth exploration of ASL grammar and complex uses of space, ways of making transitions between ideas, use of classifiers, and determining appropriate perspective in specific texts. Experience with the local Deaf community through interviews is required. Satisfies the upper-level writing requirement. Prerequisite: ASL 106 with a grade of B or better in the immediately preceding semester or permission of the instructor. (Fall)

**ASL 205 Art of Translation: ASL and English.** This course explores the meaning of translation, practices various translation methods, and analyzes both written English and recorded ASL texts, with a focus on the analysis of English texts and the development of ASL translations. Extensive discussion of various types of texts and the factors that must be considered when preparing an accurate ASL or English translation contribute to students' translation work. Satisfies the upper-level writing requirement. Prerequisite: ASL 106 (B or better) and either ASL 201 or 202 or permission of the instructor. (Spring)

**For more information, go to [sas.rochester.edu/asl/](http://sas.rochester.edu/asl/).**



## AMERICAN STUDIES (MULTIDISCIPLINARY STUDIES CENTER)



*American Studies is a great choice for anyone interested in a broad education in the humanities and social sciences.*

### Information about the Program

The American Studies program offers students the opportunity to examine American history, culture, and social life within an interdisciplinary framework. This approach, drawing on faculty members in departments such as English, art and art history, political science, classics, religion, music, anthropology, philosophy, history, and film and media studies, allows for especially rich explorations of such topics as the arts in American society; race, class, gender, ethnicity, and religion as aspects of American identity; and ideas and institutions that have shaped the United States, past and present. The major enables students to range freely across disciplinary boundaries while developing an area of focus. Students also consider the role of the American nation in a global context. Students may also minor in American studies.

#### Program Advice for First-Year Students

First-year students should be aware that American Studies is a very flexible major, allowing students to count toward its requirements virtually all of the courses in the College that deal with the United States. The courses fit into four specialization tracks: the Arts in American Culture, Identity and the American Nation, American Thought and Institutions, and Comparative Americas and Global Perspectives. In many of the participating disciplines, first-year students need not be limited to 100-level courses; students should check with departmental advisors and individual instructors or consult the American Studies program director to find out if a particular 200-level course is appropriate for them. The courses listed below do not exhaust the list of possibilities for first-year students. All American Studies students receive close advising from the program director and the Multidisciplinary Studies Center to ensure a personalized course of study.

## Courses

### Specialization Tracks

**MUR 123 Music of Black Americans.** (*Arts in American Culture track*) This course focuses on the development of African-American music from the 19th century through the latter part of the 20th century. We study how African-American music can be used as a lens through which to understand the black American experience and the social and political landscape of American society as a whole. Historical, social, economic, and other factors of various black American music genres are examined to help understand how African Americans constructed identity and interpreted the world around them. We also discuss the performative aspects of these genres in order to understand how black music artists used their bodies and asserted their agency through performance on stage. Genres explored include the 19th-century spiritual, blues, gospel, jazz, early rock and roll, soul, funk, rhythm and blues, and hip hop, among others. Same as AAS 123. (Fall)

**HIS 156 A Communist Country on America's Doorsteps: Cuba from Columbus to the Present.** (*Comparative Americas and Global Perspectives track*) The course examines the evolution of socioeconomic and political interest groups in colonial Spanish Cuba and the subsequent American entanglement in the internal historical processes in Cuba, with far-reaching unintended consequences, particularly the ultimate involvement of the Soviet Union, which brought Cuba to the center of the Cold War between the superpowers. (Fall)

**HIS 166 Liberal America, 1929–73.** (*American Thought and Institutions track*) This course is an examination of the development of American politics, society, and culture between the onset of the Great Depression and the Watergate scandal. It focuses on the creation and consolidation of the New Deal—a liberal political economy centered on a constrained corporate capitalism, a modest welfare state, and a national security apparatus designed to wage the Cold War and extend American power abroad. (Fall)

**HIS 174 American Military History.** (*American Thought and Institutions track*) American history has been largely shaped by wars. This course surveys the history of American wars; the military, naval, and civil institutions that have been created to serve the changing needs of national defense; and the citizen-soldiers who have preserved the liberty of the Republic. (Fall)

**HIS 170 African-American History I to 1900.** (*Identity and the American Nation track*) This course focuses on the cultural process of “Americanization” as Africans became African Americans and their struggle for self-expression and full freedom—family stability, education, economic, political, and social rights. Using several African-American autobiographies, the goal is to produce an accurate account of black life in America through 1900. Same as AAS 141. (Fall)

*Many departments that contribute to the interdisciplinary American studies major offer courses that are appropriate for first-year students. Students should check with departments if they are interested in 200-level courses not listed here.*

**For more information, go to [rochester.edu/college/msc/americanstudies.html](http://rochester.edu/college/msc/americanstudies.html).**

## ANTHROPOLOGY



*“Never doubt that a small group of thoughtful, committed citizens can change the world: Indeed, it is the only thing that ever has.”*

—Margaret Mead

### Information about the Department

Anthropology is the comparative study of humanity. The Department of Anthropology at the University of Rochester specializes in cultural anthropology, which specifically examines the diverse languages, social relations, and cultural meanings that humans have developed. Anthropology courses explore the concepts and methods that anthropologists use to understand contemporary social issues and cross-cultural variations in human experience. Students address questions of race, class, and gender and engage with current thinking about the future of cultural diversity in a globalizing world.

No two students have the same experience in the anthropology concentration. Undergraduate majors are encouraged to develop their own special interests through a broad selection of electives, independent study, internships, community research, summer field schools, and study abroad. Many courses include opportunity for hands-on research. Faculty members have conducted fieldwork in Brazil, China, Honduras, India, Indonesia, Nepal, the Philippines, Papua New Guinea, Rwanda, and the United States—providing a vast range of experience and expertise for students to utilize.

#### Departmental Advice for First-Year Students

Cultural Anthropology (ANT 101) provides an overview of the discipline and is the most common starting point for students interested in the program. The department also offers several introductory courses intended primarily for first-year students and sophomores in addition to a variety of electives that are open to first-year students. Students considering a concentration in anthropology should take ANT 101 during their first year, followed by ANT 200 in the fall of the sophomore year.

Anthropology is one of the most flexible social science degrees there is. Common careers for majors include nonprofit and NGO work, advertising, market research, and consulting. Many others enter graduate programs in medicine, law, or public health. Because anthropology majors build generalizable skills like critical thinking and analysis, cross-cultural and interdisciplinary comparison, and

the ability to design and conduct research, they are suited to successfully pursue a variety of careers—wherever interests may lie or develop.

#### International Baccalaureate (IB)

**Social Anthropology**—Students who receive a higher-level exam score of 6 or higher are awarded credit for ANT 101 after completion of any other course with a grade of C or better. No credit is granted for subsidiary-level exams.

#### Clusters

The department offers four different clusters: Interpretation of Culture, Power and Inequality (formerly Social Analysis), Anthropology of Globalization, and Medical Anthropology.

### Courses

#### Introductory Courses

**ANT 101 Cultural Anthropology.** This course introduces students to the distinctive ways in which cultural anthropologists do field research and write about it. Students are asked to think critically and comparatively about matters such as race, politics, gender, kinship, and religion and to consider the fate and value of cultural diversity in a world connected by global movements of people, money, media, and technologies. This class is required for a major or minor in anthropology and can be used for the minor in medical anthropology or any of the four clusters. (Fall and Spring)

**ANT 102 Introduction to Medical Anthropology.** This course explores anthropological interpretation, research, and writing on the ways different peoples understand and deal with issues of illness and disease. (Fall)

**ANT 104 Contemporary Issues and Anthropology.** This course explores the complex interrelation of race, class, and gender in contemporary America, both in people’s subjective identities and in their objective life chances. The materials assigned include first-person narratives of particular life experiences; quantitative analyses of general statistical patterns; and long-term historical explanations of these experiences and patterns. (Meets irregularly)

#### Electives Open to First-Year Students

*Below is a sampling of electives offered in Fall 2019. Elective offerings change every semester. More cross-listed electives are available through other departments.*

**ANT 257 Chinese Society after Mao.** This course adopts an anthropological approach toward understanding the dramatic socio-cultural transformations that have followed in the wake of China’s post-Mao economic reforms. What happens when a society officially committed to economic and gender equality witnesses the rise of stark social divisions? We examine such issues as the creation of a market economy, the rise of new social classes, rural to urban migration, changing ideologies of gender and sexuality, new attitudes toward education and work, transformations in family life, religious revival and conversion, and the influences of global popular culture and mass consumption. Throughout our discussions we consider the implications of these changes for China’s political, social, and economic futures.

**Core Courses**

*These courses comprise the theoretical foundations of anthropology, and each is usually offered once per academic year. Majors must take ANT 200, ANT 204, and one theory course (ANT 201–210).*

**ANT 201 History of Anthropological Theory.** A survey of major developments in anthropological thought. Prerequisite: ANT 101. (Spring)

**ANT 202 Modern Social Theory: Key Texts and Issues.** A close textual analysis of four authors who established the framework of modern social theory—Adam Smith, Karl Marx, Max Weber, and Sigmund Freud—and how contemporary social scientists use their work. (Fall)

**ANT 204 Reading Ethnography.** A critical study of the role ethnographic texts play in posing and answering questions about human culture and society. Either intensive readings on a particular society or area or a survey of ethnographic “classics” and their critics. (Spring)

**ANT 205 Theories and Debates in Anthropology.** An examination of contemporary and historical debates that have shaped theory and method in cultural anthropology. (Fall)

**ANT 206 Critical Social Theory.** A survey of feminist, poststructuralist, postcolonial, and race theory and contemporary anthropology that builds on these theoretical frameworks.

**ANT 207 Radical Social Theory.** An examination of the arguments of radical thinkers who have tried to change the world since the revolutions of 1848: Marx, Nietzsche, Lenin, Alinsky, Fanon, Foucault, and Graeber.

**For more information, go to [sas.rochester.edu/ant](http://sas.rochester.edu/ant).**

## ARCHAEOLOGY, TECHNOLOGY AND HISTORICAL STRUCTURES (MULTIDISCIPLINARY STUDIES CENTER)



*“There can be little doubt that in many ways the story of bridge building is the story of civilization. By it we can readily measure an important part of a people’s progress.”*

—F. D. Roosevelt, October 18, 1931

### Information about the Program

This innovative multidisciplinary program studies the establishment and evolution of technological, architectural, and engineering practices and their relationship to the ancient and preindustrial societies and cultures, which technology and engineering helped create and sustain. Assuming a global perspective, the program integrates material from several disciplines in engineering and the natural sciences, the humanities, and the social sciences. Students learn to apply engineering, archaeological, architectural, and historical methodologies to explore the creation of artifacts, buildings, and infrastructural systems within and across societies and cultures from the first millennium BC to the 18th century. A prominent feature of the program is optional undergraduate research under the aegis of both the University of Rochester and prestigious foreign academic institutions to address issues of interpretation, conservation, and restoration of the world’s cultural heritage.

### Program Advice for First-Year Students

This program is designed for undergraduate students interested in the humanities (archaeology, architecture, art history, classics, history) with a desire for critical insight into the material culture and technology of preindustrial societies; in mathematics or natural sciences with a desire to study the impact of technology on ancient and preindustrial cultures; or in an interdisciplinary engineering field emphasizing technology, design, materials, structures, and architecture in the context of historical monuments. Students may pursue Track A, a course-based path requiring 11 courses, or Track B, a research-based path comprising nine courses plus an 8-credit senior project (subject to faculty approval). The major offers pathways in (1) engineering, (2) archaeology and architecture, (3) history, and (4) science, technology, and society. Foundation courses provide basic competencies in engineering structural analysis, archaeology,



and architectural history common to all pathways. Depending on course selection, the major may be designed to satisfy any of the three divisions of the College: Humanities, Social Sciences, or Natural Sciences/Engineering as well as to prepare students for graduate studies in archaeology, architecture, civil or mechanical engineering, art history, classics, or history. This is not a professional program in engineering or in architecture and does not prepare graduates for licensure in either of those professional areas.

## Courses

### Fall Semester

#### *Foundation Courses*

**ME 104 The Engineering of Bridges.** An introduction to the art of bridge building based on the study of the engineering and technological problems involved in the design, construction, and collapse of bridges from antiquity to the present time. The course includes several case studies of major historical bridges selected for their structural significance. Students learn how to calculate the forces acting on structural elements, how these forces depend on the bridge structural form, how the form itself is conditioned by the structural materials, and how forces are measured with electromechanical instrumentation. The study includes fundamental notions of mechanics, strength of materials, structural behavior, instrumentation failure analysis, and design optimization. Working on teams, students use constructive experimental models as well as computer-aided programs to design, build, instrument, and test realistic bridge projects. This is a self-contained course open to all Rochester undergraduates.

#### *Core Courses*

**AH 114 Creating Architecture.** Buildings are among the most public, visible, and long-lived artifacts that a culture creates. The built environment serves both as a repository of cultural information and exerts an influence that extends beyond the society that created it. This introductory course explores a visual survey of architecture from ancient times to the present day using a slide lecture and discussion format that invites each student to participate in the discourse of the class. The studio portion of this course provides students an opportunity to create their own structures from sketch to three-dimensional pieces exploring basic design elements and materials. No prior studio experience is necessary. Students are expected to purchase basic tools used in this course. A materials supply list is provided at the first class. Students are expected to pay the \$50 studio fee to cover the use of shared supplies and equipment. To be added to the wait list, please email [stephanie.ashenfelder@rochester.edu](mailto:stephanie.ashenfelder@rochester.edu).

*Note: The following courses may have appropriate content but have not been officially approved for the Archaeology, Technology, and Historical Structures program. Please see the program director for approval.*

**ATH 112 Introduction Prehistoric Archaeology.** How did we get here? And, how do we know what we know about the past? This course is a general introduction to archaeology and world prehistory, with emphases on the methods, theories, and ethical issues of archaeological research. To this end, this course provides students

with an overview of the various theoretical and methodological approaches that have been used to study artifacts and archaeological sites and make inferences about the past. In addition, we focus on how archaeological finds are used to understand the history of human evolution, agriculture, urbanism, religion, and complex societies in many areas of the world.

**ATH 226 Archaeology of Home.** This course focuses on the ways that material traces from the past shed light on the diversity of domestic life, which includes household organization; economic strategies; the diet and status of households; ritual practice, and identity. To this end, we read case studies from household archaeology about all types of homes (mobile shelters to palaces) but also review important texts that discuss domestic space, the family, and the organization of domestic labor. Students should expect this to be a reading-intensive class with heavy emphasis on participation.

**CLA 167M Who Owns the Past? (*Meliora Seminar*)** What would “a government of the people, by the people, for the people” really look like? Is the right to vote sufficient to make a society democratic? Is majority rule any better than tyranny? Can people be trusted to rule themselves? In this course, we examine the first democracy—that of ancient Athens. We trace the historical development of democracy and explore the social factors and big ideas that shaped it into the form of government that almost every society in the world now looks to as a model. Students learn about the various institutions that allowed Athenian society to function and discover what the Athenians thought about their great experiment, even if they thought it was a very bad idea. We also observe and discuss some of our own government institutions so that we can better understand our system of government, both in what it shares with ancient Athens and how it differs. This course requires an application.

**For more information, go to [rochester.edu/college/aths/](http://rochester.edu/college/aths/).**

## ART AND ART HISTORY



*“... in denying artists their rightful place in the public consciousness, we are in fact negating the most creative part of ourselves individually and collectively and in so doing are also damning our future to one without experimentation and the vision needed to give it meaning.”*

—Carol Becker (1997)  
“The Artist As Public Intellectual”

### Department Overview

The Department of Art and Art History is dedicated to liberal education in the creation and historical study of the visual arts. Our offerings combine theory and practice and deploy interdisciplinary historical and conceptual frameworks across a wide range of interpretative techniques and forms. Undergraduate majors, minors, and concentrations in art history, visual studies, and studio art are available.

Through our undergraduate degree program in studio arts, students explore form, space, and function using traditional media and new technologies. Studio students may take courses in a variety of media, including painting, printmaking, sculpture, photography, and video.

Art history and visual studies students pursue courses in history and theory across visual media. In art history, students study the history of painting, sculpture, architecture, and other art forms from antiquity to the present covering a wide range of traditions and geographical regions across the world.

Students may undertake internships in Rochester’s diverse and rich cultural institutions. The department also offers the unique Art New York residential program in New York City.

#### *Studio Arts Program*

The studio arts program of the Department of Art and Art History focuses on the production, exhibition, and analysis of art. The facilities in Sage Art Center provide access to all the materials, supportive resources, faculty, and staff necessary for a rich studio experience. Our program is focused on contemporary approaches to art production and strives to produce technically adept students with an understanding of art’s place in the world. Our program of study invites, accommodates, and engages individuals with little or

no previous art experience. It also provides a rich environment for thoroughly intensive study.

Studio art majors are vital participants in the activities of the department and the art community in general. Majors are expected to establish a presence at Sage Art Center that promotes an environment conducive to rich, creative art production. By the senior year majors should be seen as valuable resources for the students in all introductory-level courses. While our introductory-level courses provide a foundation built on more prevalent art media—such as photography, painting, sculpture, video, collage, and drawing—the advanced-level courses make available the experimental and interdisciplinary approaches often used in contemporary art production.

Off-campus study opportunities are available for majors and non-majors alike. The Art New York program provides students with the opportunity to live and learn in New York City. A semester of internships and course work in this culturally rich environment is structured for any individual who wishes to enhance his or her knowledge of the world of contemporary art and culture with first-hand experience.

Study abroad is encouraged for majors and non-majors during a fall or spring semester in the University’s European Arts Internship program. In Europe, there are opportunities to work in institutions such as the Victoria and Albert Museum and the Museum of London, and internships can be arranged in various locations, including Paris, Brussels, Rome, Bonn, and Madrid.

#### *Art History and Visual Studies*

Art history and visual culture studies are areas of study in which the information and methodologies of many fields come together. The disciplines of art history/visual culture involve the analysis of works of art in many contexts—understanding form and why and how we make use of it. It is also the investigation of its historical contexts and modes of production. These inquiries include economic, social, and gender issues; problems of patronage and taste; and questions of exchange, reception, conservation, and restoration. Art historical studies draw upon adjunct areas of study such as cultural and intellectual history, psychology, literary criticism, religion, philosophy, sociology, archaeology, and the history of science. The history of art and visual culture studies are ideal for students who wish to acquire a general cultural understanding of global culture, to develop analytical and writing skills, and to sharpen critical sensibilities.

#### **Departmental Advice for First-Year Students**

At Sage Art Center, our 100-level courses provide a foundation for art media such as photography, painting, sculpture, video, and drawing, our 200-level courses make available the experimental and interdisciplinary approaches often utilized in contemporary art production. Advanced studio courses focus on interdisciplinarity, allowing students to expand their artistic expression to incorporate other interests and disciplines. Because studio class size is limited, first-year students should contact the department to enroll in courses.

Courses in art history are designed to give students an understanding and appreciation of works of art, individually, in relation to each other, and in their social and historical contexts. Introductory courses cover broad historical periods and serve to introduce the methods and problems of art history. They are useful to both first-year and upper-class students who want a general overview.

Sophomores, juniors, and seniors, as well as first-year students who have had a course in art history or some other relevant preparation, may begin taking art history courses at the 200 level, as well as the 100 level. The 200-level courses offer similar introductions but in much more defined areas. These are useful cognate courses for those students studying a specific period or culture in another discipline and are also the building blocks for any major or minor within the department. Seminars are indicated by the 300 level and are open to advanced students from other disciplines as well as to art history majors.

#### **International Baccalaureate (IB)**

Visual Arts—Students who receive a higher-level exam score of 6 or 7 are awarded up to four credits in studio arts upon completion of a 100-level course with a “B” or better.

#### **Advanced Placement (AP)**

If students receive a score of 4 or 5 on the Art History AP exam, credit is awarded after consultation with the department. Four advanced placement credit hours (with a score of 4 or 5) can be granted if a “B” or higher is earned in any 100-level studio course.

#### **Clusters**

Students whose major is in the social sciences or natural sciences and engineering divisions are invited to pursue a cluster in art and art history. A brochure of our clusters is available in the departmental office. All studio and art history courses are included in at least one cluster. Be sure to check with the department directly.

## **Courses**

#### **Art History**

For course updates, go to [www.rochester.edu/college/aah/courses/ah.html](http://www.rochester.edu/college/aah/courses/ah.html).

#### **Studio Art**

(A supplies fee of \$50 is charged for each course.)

For course updates, go to [www.rochester.edu/college/aah/courses/sa.html](http://www.rochester.edu/college/aah/courses/sa.html).

**For more information, go to [sas.rochester.edu/aah/](http://sas.rochester.edu/aah/).**

## **AUDIO AND MUSIC ENGINEERING**



*“Imagine. Explore. Create.”*

### **Information about the Major**

The audio and music engineering (AME) major combines studies in engineering and applied sciences with music and audio production to give students a technically rigorous, design-based education in the field of audio, music, and sonic engineering. The curriculum is built on a foundation of basic math and science and integrates elements of music, audio content production, acoustics, fundamental engineering science, signal processing hardware and software, electronics, and software engineering. Through a series of design and project courses integrated with their other coursework, students build a project portfolio throughout their studies capped by a senior design project. The bachelor of science in AME (BS AME) is offered.

#### **Departmental Advice for First-Year Students**

The major requires completion of courses and portfolio projects in five subject areas: recording arts and sound design, acoustics, audio electronics, signal processing, and software design. The curriculum provides a broad education in the basics of audio and music engineering as well as in-depth studies and design experiences. Once completing the baccalaureate degree, our graduates are prepared to enter the field or pursue further study at the graduate level. Entering students with an interest in pursuing the AME program are assigned faculty advisors to help with academic program planning throughout their four years of studies.

#### **Typical First-Year Program**

<b>Fall Semester</b>	<b>Spring Semester</b>
MTH 161 or MTH 141	MTH 162
WRT 105	ECE 114
AME 140	PHY 121
MUR 109	AME 191
Elective (cluster or Natural Science)	MUR 113



## Courses

### AME 140/EAS 103 Introduction to Audio and Music

**Engineering.** The course provides an introduction to the science and technology of audio. Students learn about the vibration of strings, musical tuning systems, overtones and timbre, and modes of oscillation through the concept of a guitar. Fourier analysis, transducers, passive electrical components, and circuits are introduced when discussing amps and audio components. The class utilizes hands-on projects to introduce the fundamental concepts of electronics, including voltage, current, resistance and impedance, basic circuit analysis, ac circuits, impedance matching, and analog signals. The course then moves on to introduce basic digital signal processing concepts using Arduinos and Pure Data to learn about conversion of sound to digital format, frequency analysis, digital filtering and signal processing, and musical sound synthesis.

**AME 191 Art and Technology of Recording.** This course covers the acoustical and psychoacoustic fundamentals of audio recording, including the nature of sound, sound pressure level, frequency and pitch, hearing and sound perception, reflection, absorption and diffusion of sound, sound diffraction, room acoustics, reverberation, and studio design principles. The course also provides practical experience in audio recording, including an introduction to recording studio equipment, microphones and microphone placement techniques, signal flow, amplification, analog and digital recording, analog to digital conversion, digital processing of sound, multitrack recording, and an introduction to mixing and mastering. Each student is required to complete a substantive recording project at the end of the course.

For more information, go to [hajim.rochester.edu/ame/](http://hajim.rochester.edu/ame/).

## BIOLOGY AND BIOLOGICAL SCIENCES



*“Biology was the glamour science of the second half of the 20th century, just as physics was the glamour science of the first half. What is glamour science? It is one that captures the public interest and serves it well. No other science has contributed as much to our understanding of ourselves (evolution and development), our relationship to our planet (ecology), or offers more promise for improving the quality of human life in the 21st (genetics, molecular medicine, genetic engineering).”*

—Martin A. Gorovsky  
Rush Rhees Professor of Biology

## Information about the Department

The University of Rochester’s Department of Biology has long been recognized as a leader in genetics research. While our faculty and students are united by a common interest in genetics, we address questions spanning a wide range of topics in molecular, cell, developmental, computational, evolutionary biology, microbiology, neuroscience, and biochemistry.

The Undergraduate Program in Biology and Medicine (UPBM) combines the resources of the School of Arts & Sciences and the School of Medicine and Dentistry to offer courses, lectures, laboratory work, specialty seminars, and research experiences to undergraduate students.

### Advanced Placement (AP)/International Baccalaureate (IB)

- AP Biology Credit Policy: Students who scored a 4 or 5 on Advanced Placement biology exams receive four general college credits.
- IB Biology Credit Policy: Students who scored a 6 or 7 on the International Baccalaureate exam receive four general college credits.

Please note that AP or IB credit may not be used to satisfy introductory course requirements in any of the biological science majors.

Students with AP credit (exam scores 4 or 5) or IB credit (exam scores 6 or 7) are eligible for enrollment in BIO 112/113 Perspectives in Biology I and II during their first year only.

### Advice for Students Preparing to Major in the Biological Sciences

The BA in biology and the seven BS curricula offered through the UPBM require the same first-year introductory coursework. Students usually enroll in BIO 110 Principles of Biology I or BIO 112 Perspectives in Biology I in the fall and then register for BIO 111 Principles of Biology II or BIO 113 Perspectives in Biology II in the spring.

BIO 110 is offered both in the fall and spring semesters. Intended biology majors are advised to take BIO 110 in the fall of their first year, while sophomores, juniors, seniors, and biomedical engineering (BME) students are encouraged to enroll in BIO 110 in the spring. Please note the CHM 131 is still a prerequisite for the spring course offering of BIO 110.

A typical course plan for the first four semesters is available online for students who are preparing to major within the biological sciences at [sas.rochester.edu/bio/undergraduate/typical-schedule.html](http://sas.rochester.edu/bio/undergraduate/typical-schedule.html).

Additionally, please note that students planning to major within the biological sciences may use AP credit for calculus, chemistry, physics, and statistics to satisfy the ancillary requirements of biology majors. However, be sure to visit the Advanced Placement section of the handbook to review each department's AP/IB policies to make sure the requirements have been met to receive credit. Students are notified of Advanced Placement credit by the College Center for Advising Services (CCAS). Those wishing to discuss AP credit should contact CCAS. Students can also request reports online.

### Fall Biology Courses for Intended Biology Majors or Students with Health Profession Interests

**BIO 110 Principles of Biology I.** First semester in a course sequence for biology majors. The course provides an introduction to biochemistry, cell biology, molecular biology, and animal physiology. Emphasis is on quantitative learning and data analysis. Students must also be enrolled in a lab and a workshop concurrent with this class. Weekly workshops emphasize the construction and interpretation of graphs; labs emphasize hands-on learning. Prerequisite: Completion or concurrent enrollment in CHM 131 or equivalent. *Note: Two sections are available. See "Placement Methods" below to determine which one is right for you.*

**BIO 112 Perspectives in Biology I.** The first semester in a yearlong introductory course sequence. Material includes fundamental aspects of genetics, biochemistry, and molecular and cellular biology. This course differs from BIO 110 in that material is covered in greater depth; there is greater emphasis on experimental approaches, data analysis, and quantitative methods; and additional readings of original research papers are required. It is designed for first-year students with a strong biology background (see prerequisites). BIO 112 examines current topics in the news that may include GMOs, human genome editing, vaccines, and embryonic stem cells. Prerequisites: students with a score of 4 or 5 on the AP Biology test or an IB score of 7. Completion or concurrent enrollment in CHM 131 or equivalent. *Note: See "Placement Methods" below to determine which intro course is right for you.*

### Biology Courses for First-Year Students

**BIO 110 Principles of Biology I** (with section instructor Michael Clark) A course designed for students who have some biology background. Ideally suited for students who have taken AP or IB biology but did not score a 4 or 6 on the respective tests. However, a confident student who has taken multiple AP courses in other disciplines should also consider this course. This course is open to upperclass students.

**BIO 110 Principles of Biology I** (with section instructor Thomas Eickbush) A first-year-student-only course designed for students with a little biological background. This course is most beneficial to students who took biology during their freshmen or sophomore year of high school. All students will take part in a weekly study group run by a graduate student mentor. A permission code is required to register for this course and can be obtained from the student's first-year advisor. If students have questions, they should contact Professor Eickbush in person Friday morning at the "Open House" or Friday afternoon at his office (HH334a).

**BIO 112 Perspectives in Biology I** (with section instructor David Goldfarb) A first-year-student course designed for confident students with strong biology backgrounds. This typically means a score of 4 or 5 on the AP Biology test or an IB score of at least 6.

### Key Points

BIO 110 (both sections) and BIO 112

- are appropriate for premedical school tracks and prepare students for upper-level biology courses (non-premed students who intend to major in the social sciences or humanities should register for BIO 101 Genes, Germs, and Genomics)
- require concurrent enrollment in chemistry (e.g., CHM 131 or equivalent)
- require laboratory attendance every other week (lab included in 4-credit course; see instructions for lab sign-up in online registration course description)
- require workshop attendance (see instructions for workshop sign-up in online registration course description).

Students with questions about introductory biology courses should visit the biology table at Open House during Orientation week to talk with the instructors.

### Fall Courses for non-Science Majors/Cluster Courses

BIO 101, BIO 102, BIO 104K are for students who do not want to major in biology but would like to pursue a biology cluster for the Natural Sciences divisional requirement of the Rochester Curriculum. See course descriptions below for applicable clusters. Please note that students with interests in medical school or health profession fields should consider taking BIO 110 or BIO 112.

**BIO 101 Genes, Germs, and Genomics: An Introduction to Modern Biology.** An introduction to selected principles of the biological sciences explored through current topics in biology. Areas of study include the organization of life, the scientific method, and understanding data. Biological and biomedical topics of contemporary interest discussed may include but are not limited to cancer, aging, stem cells, genetic engineering, genetic counseling, the genetic basis

of human disease, personal genomics, and the human microbiome. Classes involve lectures and workshop-style cooperative learning, which requires students' active participation. BIO 101 can be used in the following natural sciences clusters: Biological Principles (N1BIO002), Chemistry and Life Science (N1CHM0003), and Life on Earth (N1INT015). Prerequisites: none.

**BIO 102 Natural History.** Introduction to observation and identification of plants and animals in their environment, with emphasis on locally common trees, birds, and insects. Much class time is spent out of doors, usually visiting habitats within walking distance of campus but with two to three longer field trips. We also read and discuss selections of nature writing, ranging from Darwin to contemporary authors. Grades are based on identification quizzes, a required field journal, and a natural history essay inspired by your field observations. This course is designed for non-science majors. The course can be used for four clusters: Understanding the Biological World (N1BIO003), Life through Time (N1EES005), Sustainability and the Humanities (H1SUS001), and Science and Sustainability (N1SUS001). Prerequisites: none.

**BIO 104K Ecosystem Conservation and Human Society.** Issues in conservation biology from a viewpoint of costs and benefits to human society. Topics include the services that ecosystems provide to human society, how the value of these services is determined, and how consideration of such services influences political policy at local, national, and international levels. BIO 104 may be used in Biological Principles (N1BIO002) and Understanding the Biological World (N1BIO003) biology clusters. Prerequisites: none.

*For more information, go to [sas.rochester.edu/bio/undergraduate/](http://sas.rochester.edu/bio/undergraduate/).*

## BIOMEDICAL ENGINEERING



*“Engineering is not merely knowing and being knowledgeable, like a walking encyclopedia; engineering is not merely analysis; engineering is not merely the possession of the capacity to get elegant solutions to nonexistent engineering problems; engineering is practicing the art of the organizing forces of technological change. . . . Engineers operate at the interface between science and society.”*

—Gordon Stanley Brown

## Information about the Department

Biomedical engineering is the application of engineering principles and design concepts to medicine and biology for both diagnostic and therapeutic health care purposes. This field seeks to close the gap between engineering and medicine by combining design and problem-solving skills of engineering with medical and biological sciences to advance health care treatment, including diagnosis, monitoring, and therapy.

Prominent biomedical engineering applications include the development of biocompatible prostheses, various diagnostic and therapeutic medical devices, common imaging equipment such as MRIs and EEGs, regenerative tissue growth, pharmaceutical drugs and therapeutic biologicals. We specialize in several areas of biomedical engineering research, including biomechanics, biomedical acoustics, biomedical nanotechnology, biomedical optics, cell and tissue engineering, neuroengineering, and medical imaging.

### Departmental Advice for First-Year Students

The interdisciplinary nature of biomedical engineering requires expertise in both the biological and engineering sciences. Our curriculum emphasizes fundamental engineering and design principles taught in the context of current problems in medicine and biology. Our students are equipped with the biomedical engineering knowledge, technical expertise, and professional skills essential for successful careers ranging from engineering practice in industry or clinical settings to advanced research. Biomedical engineers find employment in a wide range of companies and are also well prepared for graduate education, including PhD programs and medical school or other health professions such as physical therapy, nursing, or dentistry.

To ensure in-depth training, students choose a concentration at the end of their sophomore year in one of four areas: biomechanics, biosignals and biosystems, cell and tissue engineering, or medical optics. The biomedical engineering senior design program introduces students to a systematic, customer-driven approach to engineering design. Over the course of their final year, undergraduate students develop prototypes of medical devices or research instruments, develop a formal design proposal, participate in formal design reviews, develop physical prototypes, test their devices, and present them on Design Day.

As part of a top-tier research institution, the University of Rochester biomedical engineering program is committed to providing undergraduates with meaningful exposure to the research process. Our students have opportunities to work side by side with award-winning faculty and research leaders at the University of Rochester to make significant contributions to biomedical research fields, including biomechanics, biomedical acoustics, biomedical nanotechnology, biomedical optics, cell and tissue engineering, medical imaging, and neuroengineering. Recent projects include experiments in bone tissue engineering, wearable hemodialysis device research, 3-D liver transplant modeling, analysis of tendon injury, neutrophil adhesion dynamics, sensory decision processing, ultrasound elastography, and hearing.



We encourage our students to study abroad, typically for one semester. The ideal semesters for our students to study abroad are sophomore spring and junior fall. Typically, students take one BME core course and either one concentration course or a basic science elective, plus a couple of culturally relevant courses. Popular destinations are New Zealand, Australia, United Kingdom, Ireland, Spain, and Hong Kong, though there are many other international programs available.

*All students interested in pursuing a BS in biomedical engineering are assigned a biomedical engineering faculty advisor.*

### Typical First-Year Program

#### Fall Semester

MTH 161 or MTH 141

CHM 131

EAS 10X (EAS 101/BME101  
strongly recommended)

WRT 105 or elective

#### Spring Semester

MTH 162 or MTH 142

CHM 132

PHY 121 or PHY 113

WRT 105 or elective

## Courses

### **BME 101/EAS 101 Introduction to Biomedical Engineering.**

The course provides an introductory overview of the multidisciplinary field of biomedical engineering. Students learn about the application of elementary engineering principles to the analysis of physiological systems and are provided with a basic introduction to the use of computers as tools for solving engineering problems. Course topics include biomechanics, cell and tissue engineering, biosignals and bioinstrumentation, medical imaging, medical optics, and bioethics. This course is included in three clusters: Biomechanics, Biomedical Engineering, and General Science. (Fall) *Strongly recommended for BME majors.*

**For more information, go to [hajim.rochester.edu/bme/](http://hajim.rochester.edu/bme/).**

## BRAIN AND COGNITIVE SCIENCES



*“... know that from nothing else but the brain come joy, delight, laughter, and sport; and sorrow, grief, despondency, and lamentation. And by this, in an especial manner, we acquire wisdom and knowledge.”*

—Hippocrates

“On the Sacred Disease” (fourth century B.C.)

## Information about the Department

Members of the Department of Brain and Cognitive Sciences study how we see and hear; move, learn, and remember; reason, produce, and understand spoken and signed languages; and how these remarkable capabilities depend upon the workings of the brain. We also study how these abilities develop, and how the brain matures to become able to organize such complex behavior. In order to understand these complex mental functions, we study not only the behaviors themselves but also the neural and computational processes that underlie them. Brain and cognitive sciences is an inherently interdisciplinary field that applies behavioral, neuroscientific, and computational methods to create new knowledge about the mind and brain. Teaching and research in our department reflect this interdisciplinary focus and span a large domain that touches on behavioral, neural, and computational sciences.

The BA and BS programs in the Department of Brain and Cognitive Sciences offer rigorous but accessible natural science concentrations for students interested in the brain and how it enables us to behave the way we do. The programs have two aims: 1) to provide sound intellectual training that will benefit students in a wide range of career paths; and 2) to provide basic disciplinary qualification for students contemplating graduate or professional training in the behavioral and neural sciences. The curricula provide excellent routes to learn the logic and methods of scientific inquiry and to learn how to reason critically; they also provide unique opportunities to engage in research that is at the frontiers of our current knowledge.

The BA curriculum consists of two foundation courses; three core courses built on these foundations; a statistics course; a laboratory methods course; four upper-level electives organized around a theme chosen by each student; and a senior seminar. The BS curriculum includes all of the requirements for the BA degree in BCS and also incorporates foundational and advanced work in allied fields, including biology, computer science, math, music theory, and linguistics. The Honors Program consists of an independent research

project leading to a senior thesis, which is presented in the Honors Seminar. For students majoring in other fields, the department offers a minor and a number of clusters (see below) that allow students to study inherently interesting questions such as: How do we recognize sounds and learn our native language? How do we read a book, recognize a face, or reach for a pencil? How do we remember what happened yesterday or during our childhood? How do these remarkable abilities develop? How does the brain become organized to perform tasks that thus far exceed the capacity of modern computers?

### Clusters

Clusters are either broad—covering the basics in all parts of the discipline—or deep—focusing on a particular subpart of the domain. The department offers nine clusters: Mind and Brain; Perception and Development; Language and Cognition; Mind, Brain, and Development; Language and Cognitive Development; The Senses; Biology and Behavior; Neurobiology; and Neuropsychology.

### Departmental Advice for First-Year Students

Students trying to determine if they're interested in BCS may begin with BCS 110 (recommended), BCS 111, or BCS 172. Students planning to pursue a BA degree should complete at least the following by the end of their sophomore year: BCS 110, BCS 111, one or more of the 3 core courses (BCS 151, BCS 152, BCS 153), plus STT 212 (statistics), if possible.

## Courses

The foundation courses (BCS 110 and 111) are entries into many of the clusters offered by the department, but students can also begin clusters by taking one of the 100-level electives (BCS 172 or 185).

**BCS 110 Neural Foundations of Behavior.** Introduces the structure and organization of the brain and its role in perception, movement, thinking, and other behavior. Topics include the brain as a special kind of computer, localization of function, effects of brain damage and disorders, differences between human and animal brains, sex differences, perception and control of movement, sleep, regulation of body states and emotions, and development and aging. Prerequisites: none. (Fall and Spring, one of the two foundation courses)

**BCS 111 Foundations of Cognitive Science.** Introduces the organization of mental processes underlying cognition and behavior. Topics include perception, language processing, learning, and memory. Integrates knowledge of cognition generated from the fields of cognitive psychology, artificial intelligence, neuroscience, linguistics, and philosophy. Prerequisites: none. (Fall and Spring, the second foundation course)

**BCS 151 Perception and Action.** Explores how the biology of our senses shapes perceptual experiences of reality. Emphasizes sense of sight primarily and hearing secondarily. An important theme is that our sensory systems play a crucial role in the execution of coordinated movements of our bodies as we navigate in and interact with the environment. Prerequisites: BCS 110 or BCS 111 or equivalent background. (Fall, a core course)

**BCS 152 Language and Psycholinguistics.** An overview of the nature and processing of human languages, including comparisons between language and animal communication systems; the biological bases of human language; and the cognitive mechanisms used in producing, understanding, and learning language. Prerequisites: BCS 110 or BCS 111 or LIN 110. (Fall, a core course)

**BCS 153 Cognition.** Considers human cognitive processes, including behavioral, computational, and neuroscience methods used to understand the nature of cognition. Explores how we perceive and integrate sensory information to build a coherent perception of the world; how we memorize and retrieve information; and how we reason and solve problems. Prerequisites: BCS 110 required; BCS 111 recommended. (Spring, a core course)

**BCS 172 Development of Mind and Brain.** Introduces human development, focusing on the ability to perceive objects and sounds, to think and reason, and to learn and remember language and other significant patterned stimulation. Includes the nature and mechanisms of development in humans and an overview of what is known about brain and behavioral development in other species. Prerequisites: none. (Spring)

**BCS 185 Social Cognition.** Social cognition combines classic social psychology with methods and theories from cognitive psychology and neuroscience to study how people make sense of each other and the social world. We examine how the social environment influences cognitive processes such as attention, heuristics, and appraisals and how these processes in turn affect decisions, behaviors, and health. We critically evaluate research on a variety of topics, such as emotion regulation, stereotyping and prejudice, and stress and decision making. Prerequisite: PSY 101. (Fall)

*For more information, go to [sas.rochester.edu/bcs/](http://sas.rochester.edu/bcs/).*

## BUSINESS



*“Good business leaders create a vision, articulate the vision, passionately own the vision, and relentlessly drive it to completion.”*

—Jack Welch

### Information about the Program

The College, in conjunction with the Simon Business School, offers both a BA and a BS in business. These majors build upon a foundation of economics and allow undergraduates to take advantage of the many courses offered by Simon School faculty. The majors are based on principles of economics and other social sciences to provide students with an understanding of business-related disciplines such as finance, accounting, marketing, analytics, and entrepreneurship. The majors provide an analytical approach for addressing current as well as future opportunities and problems in for-profit and not-for-profit organizations. Students will be well prepared to begin a career in business or to pursue further business-related studies in graduate school. The BS consists of 15 courses and is intended for students interested in studying a business discipline in greater depth. The BA consists of 11 courses, requires students to complete a second major (either a BA, BM, or BS degree), and is designed for those who have a strong interest in another discipline and wish to pursue studies in that discipline as well as in business. Both the BS and the BA satisfy the College’s social science distribution area.

The undergraduate business minor is offered by the Simon Business School for undergraduates in the College. It is aimed at building core business skills and consists of three core courses and two electives. Students may use the business minor to fulfill the social science distribution area, depending on which electives they choose. *For more information, please contact one of the business program advisors.*

#### Program Advice for First-Year Students

The business major requires that students satisfactorily complete one year of calculus before declaring the major (MTH 141–143 or MTH 161–162 sequences are acceptable). Students planning to major in business should complete the following courses by the end of their sophomore year: prerequisite calculus sequence, one acceptable statistics course and ECO 108 Principles of Economics. Students declaring the business minor must complete two prereq-

uisite courses: one acceptable statistics course and either ECO 108 Principles of Economics, or ECO 207 Intermediate Microeconomics. AP credit is acceptable for the math prerequisite, depending on the score obtained. If AP credit is awarded for ECO 108, students must take an additional higher-level economics course.

### Courses

**MTH 141–143; Calculus I, II, III.** This sequence covers the material of MTH 161–162 (see below) in three semesters. The same text is used in both 141–143 and 161–162. Placement is made by the Department of Mathematics. (All three offered Fall, Spring, and Summer)

**MTH 161–162; Calculus IA, IIA.** The first semester, MTH161, covers differentiation techniques and applications; the second semester, MTH162, covers integration and applications and additional differentiation techniques. Placement is made by the Department of Mathematics. (Both offered Fall and Spring)

**ECO 108 Principles of Economics.** This course is an introduction to the fundamental concepts of both microeconomic theory (supply and demand, cost and production, prices in markets for individual commodities) and macroeconomic theory (national income, unemployment, and inflation) with applications of theory. It gives a student preparation for subsequent economics courses. (Fall and Spring)

**ECO 207 Intermediate Microeconomics.** This course develops the fundamental building blocks of economic theory, enabling the student to gain an understanding of how economists evaluate economic problems and policies. The focus throughout is on how economic agents make choices and how prices serve as a key mechanism in the allocation of resources. Topics include competition, monopoly, taxes, subsidies, etc. Prerequisites: ECO 108 or equivalent. (Fall and Spring)

**STT 213 Elements of Probability and Math Statistics.** This course is an introduction to statistical methodology, focusing on the probability and statistical theory underlying the estimation of parameters and testing of hypotheses. Students are exposed to basic data exploration, summarization of graphical display of data, axioms of probability, distributions and related theory, parameter estimation, and statistical inference. Advanced topics include linear correlation and regression analysis. Students perform calculations with statistical software such as R/RStudio. Please note that, because of the significant overlap between these courses, students may earn credit for only one of them: STT 211, STT 212, STT 213, or BIO/STT 214. Prerequisites: MTH 141 or equivalent. (Fall and Spring)

**ACC 201 Financial Accounting.** This course is an introduction to the principles and procedures used by organizations to record economic transactions that affect them and to report the net effect of these transactions to interested external parties. The course covers the judgment inherent in certain aspects of the recording and reporting process, the acceptable alternatives for recording given transactions, and the effect these judgments and alternatives have on comparisons of the financial reports for different organizations, and on the usefulness of financial reports in general. In conjunction with this, consideration is given to the failure of financial reports to fully



incorporate the economic condition of an organization and the reason for this. (Fall and Spring)

**MKT 203 Principles of Marketing.** This course provides a broad overview of the strategic marketing function in the modern organization with central focus on customers and the management of a firm's integrated response to their needs, behaviors, and expectations. Topics demonstrate the robust nature of basic marketing theory and its application in a dynamic 21st century, with emphasis on technology-enabled relationships across diverse customer "touchpoints." The second half of the course covers practical elements of product and service brand management in both consumer and commercial market settings. Prerequisite: ECO 108. (Fall and Spring)

For more information, go to [rochester.edu/college/bsb/](http://rochester.edu/college/bsb/).

## CHEMICAL ENGINEERING



*"Science can amuse and fascinate us all, but it is engineering that changes the world."*

—Isaac Asimov (1988)

### Information about the Department

Chemical engineers apply their fundamental knowledge of the chemical and physical sciences to the solution of engineering problems that are of interest to society. They find employment in various modern industries, including microelectronics processing, biotechnology, research and development, and at chemical manufacturing facilities. They also use their engineering backgrounds as a starting point for a wide variety of other occupations, including law and medicine. For example, chemical engineers often enter the field of patent law, where their technical background can be an advantage, and their training in the chemical and physical sciences is invaluable for pursuing careers in medicine and/or biomedical research. Chemical engineers play pivotal roles in energy and environmental fields, often leading the way from initial research to protecting the planet from end-user disposal.

The bachelor of science degree in chemical engineering prepares graduates for immediately useful and rewarding industrial positions. Currently about 50 to 60 percent of chemical engineering graduates

follow this route. The others elect to obtain professional training in an allied field such as law or business or choose to go on to a master's or doctorate degree before embarking upon industrial research or academic employment. An increasing number of students are choosing to remain at the University for a fifth year of study, either to broaden their education through the University's Take Five Scholars program or to earn an MS degree. Even those who enter the workforce upon graduation eventually continue their education. Most acquire further training at the master of science level on a part-time basis, often through an employer-sponsored tuition benefits program.

### Departmental Advice for First-Year Students

Chemical engineers need a strong foundation in chemistry, physics, and mathematics. Moreover, because the solutions to society's problems frequently involve questions that transcend technical considerations, the curriculum includes a balance of humanities and social science courses as well.

Courses in chemical engineering are coordinated with separate chemical engineering laboratory courses in the junior and senior years. In these lab courses, students explore fundamental concepts learned in lectures and gain experience in problem definition and experiment design in a project format. All laboratories make extensive use of microcomputers for data acquisition and analysis, complementing their use for computation in other courses.

The department provides new students with a better understanding of what chemical engineers do by organizing several informal meetings throughout the school year in conjunction with the student chapter of the American Institute of Chemical Engineers (AIChE). Further information is available from the chemical engineering faculty advisors. Faculty advisors generally remain with assigned students during their entire undergraduate career and should be consulted for advice about programs and courses.

### Typical First-Year Program

#### Fall Semester

CHM 131  
MTH 161 or MTH 141  
WRT 105  
CHE 150/EAS 10X  
(EAS 102 recommended)

#### Spring Semester

CHM 132  
MTH 162 or MTH 142  
PHY 121  
HUM/SS Elective

### Undergraduate Research

The chemical engineering faculty are actively engaged in research projects through the PhD program as well as a graduate program leading to the master of science degree. Undergraduates enjoy the benefit of this dimension of the department through participation in a wide variety of undergraduate research and independent study projects. Some examples of recent undergraduate projects are studies of computer control of processes, interfacial oxygen transport, analysis of techniques of pollution abatement, nucleation of small particles, polymer applications in electro-optics, electrochemical processes, and biomedical problems such as bone marrow cell culture. Students usually become involved in such activities after their sophomore year.

## Courses

**CHE 150/EAS 102 Green Energy.** This course provides an introduction to basic chemical engineering concepts and focuses on renewable energy production, conversion, and utilization. Fundamental topics include energy and power metrics, material and energy balances and the fundamental laws of thermodynamics. The second half of the course focuses on traditional and alternative energy sources, energy distribution, and energy utilization. Course activities include in-class demonstrations, homework assignments, exams, and a project. This course is included in two clusters: Energy and Sustainability, and Green Engineering. (Fall)

For more information, go to [hajim.rochester.edu/che/](http://hajim.rochester.edu/che/).

## CHEMISTRY



*“The most sensuous and exciting of sciences, chemistry . . . a chemical laboratory is the most fascinating place in the world to those lucky enough to possess strong curiosity. . . .”*

—William Bolitho

## Information about the Department

The Department of Chemistry offers both BA and BS degrees. The BS degree is intended for students who want to specialize in chemistry at the undergraduate level. The BA degree offers more flexibility in planning a program and enables a student to pursue extra work in the biological, environmental, physical, and earth sciences. This course of study is sound preparation for the study of medicine or dentistry or for a career in business, law, industry, government, etc., through careful attention in the choice of courses. The BA can also be suitable preparation for graduate and professional work in chemistry.

### Departmental Advice for First-Year Students

A typical first-semester BA or BS program consists of CHM 131 or CHM 171, depending on the student's interest and preparation; MTH 161, with advice from the mathematics department; a writing course as recommended by the College Writing Program; and an elective from a chosen cluster. Students anticipating a major in

chemistry are encouraged to meet with a faculty advisor from the department during the first year in order to explore the individual student's needs and tactics for preparation for a possible major in chemistry.

### Advanced Placement (AP)

Students who have received a score of 4 or 5 on the AP exam are entitled to credit for CHM 131 and have several options available. Students may accept the credit and apply for admission to enroll in the chemistry course on organic chemistry (CHM 171); they may accept the credit and not take chemistry in the fall semester, with subsequent enrollment in CHM 132 in the spring semester; or they may waive this credit and enroll in CHM 131. The department expects that some students will select each of these options, depending on their preparation in chemistry and their future interests.

### International Baccalaureate (IB)

Chemistry—Students who receive a higher-level exam score of 6 or better are awarded credit for CHM 131 and are eligible to apply for admission to enroll in CHM 171. No credit is granted for subsidiary level exams. Students with an IB score of 6 or higher have the same options as described for students with an AP score of 4 or 5.

## Courses

The chemistry department offers three courses for first-year students during the first semester: CHM 131, CHM 137, and CHM 171. CHM 131 is part one of a two-semester sequence in general chemistry. Two sections of CHM 131 are offered in the fall, and both sections are of comparable difficulty and cover the same general topics. CHM 171 is an honors course on organic chemistry that is available to students with AP scores of 4 or 5 or IB score of 6 or higher. CHM 131 and CHM 171 are appropriate for students majoring in chemistry or related sciences. CHM 137 is a one-semester introduction to general chemistry specifically for engineering students. Students should select the course that most closely supports their particular interests.

Both the BA and BS chemistry degrees require only two courses in physics, Physics 121–122, or 113–114. However, chemistry majors pursuing a BS degree are strongly encouraged to take the Physics 121–123 sequence and begin during the spring semester of the first year. All chemistry majors should continue with their mathematics sequence in the spring semester.

### CHM 131 Chemical Concepts, Systems, and Practices I.

This course serves as an introduction to the concepts of chemistry for science and health professions students and as a science course for students of the humanities and social sciences. Properties of chemical systems are discussed from a macroscopic and molecular perspective, with examples developed from a theme of energy and the environment. Topics include stoichiometry, atoms and molecules, properties of gases, thermochemistry, chemical equilibrium, acids and bases, solubility equilibria, and oxidation-reduction reactions. These topics are discussed in the context of the following energy and environment-related issues: elemental resources of our planet, energy production and utilization, what makes a good fuel, and aqueous resources. There are three 50-minute (M, W, F) or two 75-minute (T, R) lectures per week. In addition, there is a three-

hour laboratory in alternate weeks, a 50-minute laboratory lecture, and a 75-minute workshop. (Fall)

### CHM 132 Chemical Concepts, Systems, and Practices II.

A continuation of Chemical Concepts, Systems, and Practices I, emphasizing energy and the environment. Topics include chemical kinetics, electrochemistry, thermodynamics, properties of atoms, atomic structure, and chemical bonding. These topics are discussed from the perspective of the efficiency of energy utilization; what makes processes spontaneous; the kinetics of ozone depletion; and how energy is extracted from nuclei, atoms, and molecules. There are three 50-minute (M, W, F) or two 75-minute (T, R) lectures per week. In addition, there is a three-hour laboratory each week, a 50-minute laboratory lecture, and a 50-minute workshop. Prerequisite: CHM 131. (Spring)

**CHM 137 Chemical Principles for Engineers.** This one-semester introduction to general chemistry is specifically for engineering students requiring only one semester of chemistry. The course is designed to give engineering students a conceptual foundation in the principles of chemistry that are relevant to solving engineering problems. Important topics include the nature of chemical compounds; stoichiometry, properties of gases; the periodic table; electrons and atoms; chemical bonding and applications to materials; thermodynamics and energy; rates of chemical reactions; chemical equilibrium; electrochemistry. In addition to lectures, there are weekly 75-minute workshops. A 75-minute lab lecture and three-hour laboratory are also held every other week. (Fall)

**CHM 171/173 and 172/210 Fr. Organic Chemistry.** These courses constitute a one-year exploration of the basic observations, concepts, and practice of organic chemistry, with a focus on the fundamental relationships among molecular structure and chemical reactivity. The exploration requires that students grapple with defining questions, evaluating evidence, weighing arguments, reflecting on epistemological issues, constructing new experiments, etc. The study of organic chemistry is carefully integrated with a review of the key concepts from general chemistry. Fr. Organic Chemistry is designed for first-year students with good preparation in chemistry (e.g., two years of general chemistry and AP score of 4 or 5, or equivalent preparation). Please note: CHM 171 (Fall) and 172 (Spring) are each four-credit courses that individually meet for three separate lectures and one two-hour workshop each week. CHM 171 has a required companion lab, CHM 173 (1 credit) (Fall), that meets for one lab afternoon per week (1 credit). CHM 172 has a required companion lab, CHM 210(W) (2 credits) (Spring). This sequence will meet all of the requirements for a year of organic chemistry with lab and prepares students to enter upper-level chemistry courses.

**For more information, go to [sas.rochester.edu/chm/](http://sas.rochester.edu/chm/).**

## CLASSICS



*"I would make all learn English: and then I would let the clever ones learn Latin as an honour, and Greek as a treat."*

—Winston Churchill

*"To read the Latin and Greek authors in their original is a sublime luxury. . . I thank on my knees him who directed my early education for having in my possession this rich source of delight."*

—Thomas Jefferson

The ancient civilizations of Greece and Rome have influenced all successive western societies, leaving a legacy that includes ideas about democracy, empire, myth, society, race, gender, and philosophy. At the University of Rochester, the study of ancient Greece and Rome is not merely a matter of antiquarian interest; rather, our courses enable students to explore the past in ways that allow them to understand the present and imagine the future. Students study the foundational texts and significant artifacts of the western world in order to understand them on their own terms and in their ancient contexts as well as to develop a deeper awareness of the ways in which classical antiquity has shaped and continues to influence contemporary society.

Students can approach the study of the ancient world in a range of ways; some students focus on the history, culture, and archaeology of Greece and Rome, while others concentrate on the study of languages and literature; and, of course, many students do both. Therefore, in addition to developing a solid foundation in Greek and Latin language, students may select from courses in ancient drama, mythology, and poetry as well as from courses that focus on ancient Greek and Roman religion, philosophy, and culture. The department also offers courses on more specific topics such as the ancient city; Greek and Roman ideas about race and ethnicity; issues related to gender, sexuality, and family life; specific mythological or historical figures such as Hercules or Alexander the Great; and even on ancient techniques of engineering.

The classics program offers several study abroad courses, led by Rochester faculty, in which students can participate (one does not need to be a classics major to participate in these programs):

- **Archaeological Dig in Italy (summer):** Every summer, the classics department runs an archaeological dig in Italy in which students not only learn about ancient Roman history and



material culture but also develop their skills in field methods of archaeology.

- ***Pagans and Christians in Rome (spring break)***: Spring break trip to Rome to study the interaction of Pagans and Christians in ancient Rome. Site visits include the Colosseum, Pantheon, Catacombs, Mithraeum, and much more.

In addition to the major concentration in Classics and Classical Civilizations, the department offers minors in Classical Civilizations, Greek, and Latin. Recent graduates of the department have an excellent record of admission to graduate school as well as to medical school and law school. The classics program is housed in the Department of Religion and Classics.

### Advice for First-Year Students

For students who want to focus on the study of the history, culture, and literature of ancient Greece and Rome, we suggest that you begin with the 100-level course that is of interest to you. For students who want to begin with the study of Greek and Latin language, Greek 101 and Latin 101 assume no previous knowledge and are intended for students with little to no experience of the language. Students who are considering entering the sequence at a higher level than 101 in Greek or Latin are strongly encouraged to consult with Professor Nicholas Gresens ([nicholas.gresens@rochester.edu](mailto:nicholas.gresens@rochester.edu)) as soon as possible. Students are not permitted to register for or receive credit for a language course if they have already achieved proficiency at the level of that course.

### Advanced Placement (AP)

A score of 4 or 5 on the Latin examination will earn credit for LAT 102. Students who complete a second Latin AP examination with a score of 4 or 5 may earn credit for LAT 208 upon completion of a Latin course numbered 103 or above with a minimum grade of “B.”

### International Baccalaureate (IB)

Latin—Students who receive a score of 5 or above on the higher-level exam are awarded credit for LAT 102.

## Courses

### Fall Semester

#### Classics

**CLA 101 Introduction to Greek and Roman Antiquity.** This course provides an introduction to the ancient Greek and Roman worlds and to the varied disciplinary approaches that inform our study of classical antiquity. Students explore touchstones in the literature, mythology, history, art, and archaeology of ancient Greece and Rome; these include the Trojan War, the Olympic Games, Athenian culture in the age of democracy, the rise and fall of Rome’s empire, the violence of the Colosseum, and the emergence of Christianity. In the process, students become familiar with key aspects of Greek and Roman culture while learning about how we in the modern world construct our knowledge of the past.

**CLA 103/CLA 167M Who Owns the Past?** As the recent destruction of the archaeological site of Palmyra in Syria and the removal of Confederate statues in New Orleans show, historical objects, monuments, and sites are not relegated to the past; instead,

they are the building blocks of modern identities and politics. This course examines current issues concerning the ownership, protection, and presentation of cultural heritage, including particularly archaeological and historical objects, monuments, and sites. The course begins with introductory information about archaeology, museum studies, and cultural heritage law. We then consider such questions as: Who decides what cultural heritage is significant? Who should determine how archaeological and historical sites are presented to the public? Should private individuals be allowed to purchase objects of historical or archaeological significance? What moral and ethical responsibilities do museums have? Who owns cultural objects taken in the context of warfare?

**CLA 121 The Ancient Roman World.** An examination of the history, culture, and society of ancient Rome from its origins through the republican period to its growth as a major empire in the Mediterranean world. All sources in English translation.

**CLA 140 Classical and Scriptural Background.** Homer, Virgil, and Ovid. Greek tragedy and comedy: Aeschylus, Sophocles, Euripides, and Aristophanes. The Hebrew Bible—Abraham and Isaac, Moses and Pharaoh, Esther and Judith—and Christianity’s New Testament. The two great traditions studied in this introductory course—classical and Biblical—have been pondered by generations of writers and artists for thousands of years. A great deal of literary history is the story of intricately rewriting and adapting the core texts of these traditions; it has been said that the European philosophical tradition is a series of footnotes to Plato. While doing justice to any one of these authors or traditions in a single semester would be a challenge, the goal of this class is to read as much as possible of the classical and scriptural tradition in the short time we have, giving you a solid introduction to some of the key stories and ideas that have generated so much thought, conflict, and human creativity over the past two dozen centuries. First-year students welcome.

**CLA 203 History of Ancient Philosophy.** Survey of the origins of Western philosophy. The course begins with the Pre-Socratics and ends six centuries later with the Hellenistic philosophers. The great philosophers of the classical period—Socrates, Plato, and Aristotle—are studied in detail.

**CLA 208 Medicine, Magic, and Miracles.** Examination of the intersection of religion and healing by examining the range of ways in which people understood and responded to the experience of illness and physical suffering in Greco-Roman antiquity and the various means by which they sought healing. Drawing on a range of sources, such as medical treatises, religious texts, and archaeological evidence, the focus is on “Medicine” (the development of “professional” medicine in ancient Greece and Rome), “Magic” (magical practices, texts, and magicians as healers), and “Miracles” (miracle workers such as Jesus and Apollonius of Tyana, healing religions such as the Asklepios cults, and the emerging Christian movement).

#### Greek

**CGR 101 New Testament and Classical Greek I.** This course provides an introduction to ancient Greek, the language used by classical Attic authors as well as the writers of the New Testament and other early Christian texts.

**CGR 103 Intermediate Greek.** This course offers an intensive review of Greek grammar combined with readings in Greek prose in order to strengthen students' knowledge of classical Greek and improve translation skills. We translate and discuss Xenophon's *Memorabilia*, a dialogue about Socrates.

### Latin

**LAT 102 Elementary Latin II.** This course completes Latin 101's introduction to Latin grammar and introduces the reading of continuous Latin prose.

### Spring Semester

**CLA 135 Mythology.** Introduction to the mythology of the classical world. We examine the major myths about the gods, the origins and nature of the universe, and the heroic past as they developed in the Greek world and as they were adapted in the Roman world. We consider the nature and function of myth in society, some theoretical approaches to myth, and the way in which myths were adapted by Greek and Roman authors to fit a particular literary or historical context. This course also devotes time to comparing the classical system of myths to other mythological systems.

**CLA 225 War and Society in Ancient Society.** In this course we study the interplay between warfare and the political, social, and economic structures of the ancient Greek and Roman worlds. We explore motivations for and ideologies of armed conflict, the impact of war on political and cultural development, the evolution of tactics and strategy, and the effects of hegemonic and imperial expansion on both the conquerors and the conquered. The course readings incorporate foundational modern perspectives but emphasize ancient sources. All ancient sources are read in English translation.

**CLA 237 Hercules: Myth and Legacy.** In this discussion-based class we examine the myths surrounding Hercules as well as his representation in literature, art, and film from the ancient world to modern times. Pertinent questions include how Hercules has been imagined, why his myths have persisted so strongly, and what his significance has been in various contexts over time. All readings are in English.

**CLA 221 Classical Archaeology: Roman Art and Archaeology.** An examination of the physical remains of ancient Roman civilization, with an emphasis on architecture, sculpture, painting, and other visual arts, in order to understand Roman culture and society.

**CGR 102** Beginning New Testament and Classical Greek II. A continuation of CGR 101.

**LAT 101 Elementary Latin I.** An introduction to the Latin language based on the ancient authors and designed to prepare students for the reading of classical and medieval texts.

**LAT 103 Intermediate Latin.** This course, the third in the introductory sequence, consists of readings from a selection of Latin prose and poetry with accompanying grammar review.

*For more information, go to [sas.rochester.edu/re/](http://sas.rochester.edu/re/).*

## COMPUTER SCIENCE



*"Computer science is no more about computers than astronomy is about telescopes."*

—Edsger Dijkstra

### Information about the Department

The Department of Computer Science (CSC) at the University of Rochester is well known for its research and its collegial atmosphere. Degrees offered include an elite undergraduate major, a flexible master's degree, and an intense program leading to the doctor of philosophy. Particular emphasis is placed on computer vision and robotics, human-computer interaction, natural language understanding and knowledge representation, machine learning, systems and architecture, data analytics, and theory of computation.

#### Departmental Advice for First-Year Students

Students have the option of completing a BS, a BA, or a minor in computer science. Many students in other fields also find courses in computing both interesting and useful. Those who major in the humanities and social sciences may choose to take a cluster in CSC. Of the two bachelor's degrees, the BS requires a greater number of upper-level courses in computer science and is appropriate for students who aspire to achieve a high-level research and development position in the computer industry, those who plan to go on to earn an MS or a PhD, or those who simply wish to have the broadest and deepest knowledge of the field. The BA curriculum is highly flexible and can be customized to support students interested in the intersection of computer science with other disciplines, such as computational linguistics, studio arts, computational biology, digital media, etc. The entry point for both programs is CSC 171 and MTH 150 concurrently. Students who are placed into the MTH 14x series will start by taking CSC 161 and MTH 141. A placement exam is given during Orientation for first-year students who wish to be placed directly into CSC 172 without having taken AP Computer Science.

#### Advanced Placement (AP)

Students who have passed the AP Computer Science A exam with a 4 or a 5 may receive credit for CSC 171, should they wish, and can be placed into CSC 172.

**International Baccalaureate (IB)**

Computer Science—Students who receive a higher-level exam score of 5 or better may receive credit for CSC 171, should they wish, and can be placed into CSC 172.

**Introductory Courses**

**CSC 108 Technical Literacy.** Technical computing is a survey course of fundamental concepts of digital data/information in the form of text, imagery, 3-D data, and geographic information. We cover how these are used in text editors, spreadsheets, image editors, animation tools, GIS, databases, and programming languages. Productivity tools in collecting, documenting, disseminating, and securing digital data applicable to other disciplines are also discussed and emphasized. Concepts in technology such as cloud-based applications, collaboration tools, open source software, business models, and social/legal impacts are presented in the form of readings, audio/video podcasts, and guest lectures. A detailed course description/syllabus is at [bitly.com/CSC108\\_SYLLABUS](http://bitly.com/CSC108_SYLLABUS). This class is not open to computer science majors. Prerequisites: none. (Fall)

**CSC 131 Recreational Graphics.** A hands-on introduction to 3-D computer graphics and animation techniques taught from a user's point of view. Topics include 3-D modeling, animation, and simulation. Assessment based on projects. No written exams. Prerequisites: none. (Fall)

**CSC 161 Introduction to Programming.** Hands-on introduction to programming using the Python programming language. Covers basic programming constructs, including statements, expressions, variables, conditionals, iteration, and functions, as well as object-oriented programming and graphics. Recommended for non-majors and students with less math and science background. Lab and workshop required. Prerequisites: none. (Fall and Spring)

**CSC 170 Web Design and Development.** An introduction to the World Wide Web and related technologies. Topics include HTML5 and CSS3, Progressive Enhancement, and web page design. Emphasis is on fundamentals, industry standards, and best practices. Additional topics include website construction techniques, mobile design issues, and Search Engine Optimization (SEO). Programming with JavaScript is introduced. Prerequisites: none. (Fall and Spring)

**CSC 171 Introduction to Computer Science.** Hands-on introduction to programming using the Java programming language. Teaches fundamentals of programming and more advanced topics. Emphasizes algorithmic thinking and computational problem solving and provides an introduction to the concepts and methods used in computer science. Required for all CSC majors. Lab and workshop required. Prerequisites: none. (Fall and Spring)

**CSC 172 Data Structures and Algorithms.** Abstract data types (e.g., sets, mappings, and graphs) and their implementation as concrete data structures in Java. Analysis of the running times of programs operating on such data structures and basic techniques for program design, analysis, and proof of correctness (e.g., induction and recursion). Small-group problem-solving workshops are an integral part of this course. Lab and workshop required. Prerequisites: CSC 171 or equivalent, MTH 150. (Fall and Spring)

**CSC 175 Creative Computing.** Quick! How much would a tunnel under Lake Ontario cost? How many people probably touched that orange you just bought at Wegmans? Can the military's satellites really read your license plate from orbit? Explores the creative use of computational mechanisms and information sources to obtain rough estimates and feasibility analyses for interesting questions and practical problems and looks at the technological basis of the art of measurement. Prerequisites: none. (Fall)

*For more information, go to [cs.rochester.edu/undergraduate/index.html](http://cs.rochester.edu/undergraduate/index.html).*

**DANCE****Information about the Program**

The Program of Dance and Movement is unique in that it currently offers students a BA in dance with two concentrations, a minor in dance, a minor in movement studies, four options for a cluster, and a wide variety of elective course options. The program is committed to offering experiential and theoretical study of dance and movement that honors and informs the whole person. Coursework emphasizes dance as an art form; creative process; critical thinking, self-awareness, contemplative practice; the nature of community, diversity, and an appreciation of diverse ways of thinking and moving. It explores the use of dance and movement as a means of creative and personal expression; as mindful, physical, and spiritual practice; and as a way of understanding culture, traditions, and philosophies from all over the world.

The program sponsors a guest artist series, which features performances, lecture-demonstrations, and workshops by internationally and nationally acclaimed dance artists and educators who share their passion for the arts with the University and the surrounding community. In addition, an annual inspireDANCE Festival takes place over eight days in January or February and features more than 30 open master classes and workshops, a featured concert by a professional dance company, student performances, an inspireJAM bboy and bgirl battle, and other events such as a salsa night or swing dance evening.

Through study in the program of dance and movement, students will have the potential for participation in and an understanding



of a dance-related career including but not limited to performance, teaching, arts management, choreography, dance criticism, creative arts therapies, and dance/movement science. Regardless of a student's career path, study in our program will help foster educated audiences and participants in the field of dance and movement in culture. Our diverse courses and faculty promote a sense of community within which discussions take place about cultural identity, about gender, about dance as art, about art as a voice and mirror for not only personal expression but also for society, politics, social change, and current issues. Dance appreciation, movement for health, and connectedness of body and mind are at the heart of our purpose in educating students in dance and movement studies as scholarly endeavors.

### BA in Dance

The BA comprises at least 50 credits, and the dance studies concentration can include up to 12 credits from another discipline to add up to 50 total. Choose from one of two concentrations:

- **Creative Expression and Performance:** This program is flexible enough that students can choose to focus on Western dance forms, such as contemporary modern dance and contemporary ballet, or world dance forms, such as those from the African Diaspora that might include West African dance, capoeira, Middle Eastern dance, hip hop, and jazz.
- **Dance Studies:** This program incorporates two or three courses from virtually any other discipline and interweaves them with studies in dance and/or movement. Students can choose to combine their studies in a second major with the dance studies major in order to explore interdisciplinary applications in the sciences, humanities, and/or other areas.

### Two Minors

The minor comprises at least 26 credits and is flexible enough to accommodate individual choice of study in various dance and movement forms.

- Dance
- Movement Studies

### Clusters

**Improvisation and Creative Process (H1DAN006)**

Discover your potential for creativity and investigate platforms for developing dances and personal movement vocabularies.

**Movement and Culture (H1DAN007)**

Investigate movement and dance from different communities around the world, both theoretically and experientially, learning to appreciate culture in an embodied manner.

**Mind-Body/Somatics (H1DAN009)**

Study the mind-body-spirit relationship, focusing on finding connections between the inner physical world and the external environment.

**Dance and Performance (H1DAN010)**

Explore your interest in the art of dance and performance. Through study in dance technique and theory as well as the context within which dance exists in the field, you will have opportunities to experience, view, and discuss the art of dance, performance, and creative expression.

## Courses

**DAN 102 Fundamentals of Movement.** Explores movement through the use of technique and improvisation. It provides a strong foundation for further study in dance, theater, or sports and heightens body awareness. No previous dance training is required. (Spring)

**DAN 104 Contact Improvisation I.** This course is rooted in dance, the martial arts, and studies of body development and awareness. We explore solo and duet skills such as rolling, falling, balance, counterbalance, jumping, weight sharing, spirals, and attuning to sensory input. No previous dance training required. (Fall)

**DAN 110 Beginning Dance Techniques (Jazz, Ballet, and Modern).** Serves as an introduction to dance technique, specifically in jazz, ballet, and contemporary modern dance. Emphasis is on the development of basic skills, patterns of body organization, alignment, continuity and connectivity, and rhythmic and bodily awareness. No prior training is necessary or expected. Students who have had prior training will be challenged individually. (Spring)

**DAN 130 Conditioning for the Dancer/Athlete.** Aims to develop and strengthen specific musculature as it pertains to physical demands of dancers, athletes, and martial artists as well as those who wish to explore a mindful, physical, and anatomically sound practice. (Fall)

**DAN 145 Beginning Jazz Dance.** Vernacular jazz movement as it relates to jazz music and its historical context. (Fall)

**DAN 150 Beginning Contemporary Dance Technique.** Introduces the technique and theory of contemporary modern dance. Dance appreciation, experiential practice and movement observation are the overarching areas of focus in this course. Though this course is taught at the beginning level, students at all levels will be challenged. (Spring)

**DAN 160 Dance Improvisation.** Designed for those with some experience in dance who wish to explore mechanisms for generating movement and dance through improvisation. The course aims to develop understanding of improvisation as practice, technique, performance, and composition. (Spring)

**DAN 171 Capoeira: Brazilian Art Movement.** An art form of self-defense with strong aerobic and dance elements that brings together a harmony of forces. Through the study of the history, movements, and culture behind Capoeira, students gain self-confidence, power, flexibility, endurance, and, ultimately, the tools toward self-discovery. (Fall and Spring)

**DAN 181 West African Dance Forms I.** Dynamic dance traditions of Guinea, West Africa. Accompanied by live music, students learn footwork and movements for several rhythms and acquire familiarity with the physical stance common to many styles of West African dance. (Fall)

**DAN 188 Hip Hop Culture and Breaking.** Provides a look into the historical origins and social importance of hip hop culture. The class format is geared toward physical movement along with lectures, videos, and opportunities to attend events in the community. (Fall)

**DAN 209 Qi Gong: Chinese Way to Health.** A study of the cultural, lifestyle, and movement aspects of Qi Gong for health and fitness. Qi Gong provides the dancer with training for relaxing the body, breathing, and mind and for awareness and mindfulness as well as for cultivating, harmonizing, and expressing energy. (Fall and Spring)

**DAN 245 Dance/Movement Therapy Foundations.** Examines the field's approaches to (1) enhancing personal, professional, and creative development, and (2) treating a wide range of challenges (e.g., autism, anxiety, eating disorders, abuse, developmental challenges, and psychosis). Students learn how Dance/Movement Therapy integrates natural movement, formal elements of dance, music, language, psychology, counseling, neuroscience, and concepts drawn from Asian approaches to healing. (Fall)

**DAN 248 Arts and Activism.** Dance is powerful. Art is a tool that inspires social change. This course examines the relationship between social activism and artistic practice, exploring this integration in dance, art, music, and film. (Fall)

**DAN 250 Intermediate Contemporary Dance: Context and Practice.** Dance appreciation and technical practice. Practice contemporary dance experientially through examining movement principles and exploring choreographic combinations. (Fall)

**DAN 290 Middle Eastern Dance: Orientale.** Unveil the grace and beauty residing in the creative nature of Middle Eastern dance. Class work includes meditative movement, dance technique, improvisation, and rhythm identification through music and drumming. No prior dance experience necessary. (Fall)

**DAN 385 Dance Performance Workshop.** Within a choreographic process, students take part in the creation of new work. Experience a rehearsal process from beginning to end, addressing a variety of performance techniques and the unique and personal artistry that is yours alone. Prerequisite: Permission of instructor or by audition on the first day of classes. (Fall)

**For more information, go to [sas.rochester.edu/dan/](http://sas.rochester.edu/dan/).**

## DATA SCIENCE



*"Information is the oil of the 21st century, and analytics is the combustion engine."*

—Peter Sondergaard, Senior Vice President, Gartner Research

### Information about the Program

Data science is an interdisciplinary field about principles and algorithms for extracting knowledge and insights from many kinds of data, including financial data, scientific data, natural language text, and images and video. Students learn to use techniques and theories drawn from mathematics, statistics, and computer science, including machine learning, data mining, inferential statistics, databases, and data visualization. In addition, students delve deeply into a concentration area where data science can be applied. Concentration areas include biology, biomedical signals and imaging, brain and cognitive sciences, business, computer science, earth and environmental sciences, economics, mathematics, physics, political science, and statistics. During their senior year, students take a capstone course where they work in teams to solve real-world problems with industry mentors.

There is extremely high demand in business, health care, technology, and government for data scientists. The data science BA and BS degrees prepare students for a variety of careers in data analytics and for graduate study in the physical, life, social, or computational sciences.

#### Program Advice for First-Year Students

Students considering majoring in data science should take discrete mathematics and start a calculus sequence and the introductory computer science sequence as soon as possible. These prerequisite courses must be completed before declaring the major. Concentration area courses are at the 200-level or above, and some might require additional prerequisite courses that could be taken during the first year.

**No minors or clusters are available in data science.**

**Advanced Placement (AP)**

AP credit can be awarded for CSC 171 and for some of the prerequisite calculus courses. Students who wish to be awarded AP credit must check with the department that parents the course for specific requirements.

**Courses**

Following are the prerequisite and a selection of introductory courses in the major.

**MTH 150 Discrete Mathematics.** Logic, functions, algorithms, mathematical reasoning, mathematical induction, recurrence relations, techniques of counting, equivalence relations, graphs, trees. *Prerequisite for declaring the major.* (Fall and Spring)

**MTH 161 Calculus I and MTH 162 Calculus II; or MTH 141 Calculus I, MTH 142 Calculus II, and MTH 143 Calculus III; or MTH 171 Honors Calculus I and MTH 172 Honors Calculus II.** *Prerequisite for declaring the major.* (Fall and Spring)

**MTH 165 Linear Algebra with Differential Equations.** Matrix algebra and inverses, Gaussian elimination, determinants, vector spaces, eigenvalue problems. First order differential equations, linear second-order differential equations with constant coefficients, undetermined coefficients, linear systems of differential equations. Applications to physical, engineering, and life sciences. Prerequisites: MTH 143, 162, or MTH 172. MTH 162 (or equivalent) is a strict prerequisite and *must* be completed before taking 165. NOTE: MTH 164 is not a prerequisite for MTH 165. Due to overlapping content, it is not recommended to take both MTH 163 and 165. (Fall and Spring)

**CSC 171 The Science of Programming.** Discovering, formulating, and exploiting the structure of problems to aid in their solution by computer. An introduction to algorithmic problem solving and computer programming in Java. Small-group problem-solving workshops and labs are an integral part of the course. *Prerequisite for declaring the major.* (Fall and Spring)

**CSC 172 The Science of Data Structures.** Abstract data types and their implementation as concrete data structures in Java. Analysis of the running times of programs and general techniques for program design and analysis. Small-group problem-solving workshops and labs are an integral part of the course. *Prerequisite for declaring the major.* Prerequisites: CSC 171 and MTH 150. (Fall and Spring)

**DSC 201 Tools for Data Science.** This course provides a hands-on introduction to widely used tools for data science. Topics include Linux; languages and packages for statistical analysis and visualization; cluster and parallel computing using Hadoop and Spark; libraries for machine learning; no-sql data stores; and cloud services. (Fall: majors only; Spring: non-majors)

**DSC 240 Data Mining.** Fundamental concepts and techniques of data mining, including data attributes, data visualization, data preprocessing, mining frequent patterns, association and correlation, classification methods, and cluster analysis. Advanced topics include outlier detection, stream mining, and social media data mining. Prerequisites: CSC 172 *and* MTH 161 or MTH 171 or MTH

142 *and* one of CSC 242, DSC 262, or linear algebra (MTH 165, MTH 235, or MTH 173). (Fall and Spring)

**DSC 261 Database System.** This course presents the fundamental concepts of database design and use. It provides a study of data models, data description languages, and query facilities including relational algebra and SQL, data normalization, transactions and their properties, physical data organization and indexing, security issues and object databases. It also looks at the new trends in databases. The knowledge of the above topics will be applied in the design and implementation of a database application using a target database management system as part of a semester-long group project. Prerequisites: CSC 172; CSC173 and CSC 252 recommended. (Fall and Spring)

**DSC 262 Computational Introduction to Statistics.** This course covers foundational concepts in probability and statistical inference using the R programming language. Topics include probability theory, combinatorics, principles of statistical classification, statistical estimation and hypothesis, and statistical models. Prerequisites: MTH 150 and MTH 161 or MTH 171 or MTH 142. (Fall)

**DSC 265 Intermediate Statistical and Computational Methods.** This course is a continuation of CSC 262, covering intermediate statistical methodology and related computational methods, with an emphasis on the R statistical computing environment. Prerequisites: CSC 262 and MTH 165 or MTH 163 or MTH 235. (Spring)

**DSC 383W Data Science Capstone.** This course provides an experience for data science majors to apply the core knowledge and skills attained during their program to a tangible data science focused project. Students work with external sponsors in small teams on a project that applies data science methods to the analysis of a real-world problem. The identified projects or problems and datasets cover a range of application areas and reflect real-world needs from industry, medicine, and government. Each student is required to write a paper about their project, which will satisfy one upper-level writing requirement for undergraduate students registered in DSC 383W.

**For more information, go to [sas.rochester.edu/dsc/](https://sas.rochester.edu/dsc/).**



## DIGITAL MEDIA STUDIES (MULTIDISCIPLINARY STUDIES CENTER)



*“It’s technology married with liberal arts, married with the humanities that yields us the results that makes our heart sing.”*

—Steve Jobs

### Information about the Program

Designed by faculty within Arts, Sciences & Engineering, the digital media studies major provides students with the skills necessary to critically appraise and actively produce digital media. In a world of ubiquitous computing and constant digital connectivity, digital literacy and the ability to effectively communicate with and design for digital media users are valuable, marketable skills. This major blends theoretical and historical understandings of past and present medias with hands-on uses of emerging technologies, programming, and software. The ability to create digital media has become both more pervasive and increasingly inexpensive, but the number of rigorously trained digital media designers and producers falls woefully short of industry needs. This major is designed to supply this demand and prepare students to succeed in one of the biggest professional growth fields around today.

A distinctive component of the major is the capstone project in which all students in the major collaborate on the design and production of a form of digital media of their choosing beginning in the spring of their junior year and continuing throughout their senior year. Much of the work in the digital media studies major takes place in Rettner Hall, a brand-new facility designed to house the program and featuring cutting-edge computers, software, and technologies.

To date, 95 percent of digital media studies graduates have gone on to graduate school (Johns Hopkins, Northeastern, University of Michigan) or professional work, many with digitally relevant firms such as Google, IBM, Spotify, Netflix, Disney, and Atlantic Media.

#### Program Advice for First-Year Students

Students interested in digital media studies are strongly urged to begin core DMS coursework with DMS 101, DMS 102, DMS 103, and DMS 104. These core courses are offered in both fall and spring semesters and do not need to be taken consecutively. Since these courses prepare students for the variety of upper-level courses that

make up the major, students are encouraged to complete this core coursework before the end of their sophomore year. Because the major is flexibly designed, however, students can begin taking production courses while they are working on core courses. Thus, in the spring semester a student might take DMS 104 in conjunction with a course on digital art, for example, or one on machines and consciousness. In the sophomore year, students continue the core and production courses, begin advanced-level media history and theory work, and may enroll in the required Digital Applications course.

### Courses

#### Core Courses

**DMS 101 Introduction to Digital Media Studies.** In this class we critically think about the creation, production, distribution, consumption, and reception of digital media. Readings and class discussions focus on the theory, history, and practice of digital media and its application in the humanities, social sciences, and our world. Students produce individual research in the form of written responses, as well as collaborative digital projects. The course’s goals are to prepare students to thoughtfully critique our digital world, create scholarly digital projects, and understand the multifaceted importance of media in today’s society. (Fall and Spring)

**DMS 102 Programming for Digital Media.** This course introduces core concepts and techniques of computer programming to prepare students for more advanced topics in manipulation, storage, and transmission of digital media. Students develop an understanding of computer capabilities and the skills required of computer programmers. No previous programming experience is required. (Fall and Spring)

**DMS 103 The Essential Digital Media Toolkit.** This course introduces students to current software for creating, editing, and producing core digital media objects: photographs, video, vector images, 3D models, and video games. This fast-paced project-driven course invites experts in the fields of photography, video, graphic design, rapid prototyping, and gaming to share their knowledge and experience. Through finding creative solutions to problems posed by instructors, students manipulate photographs, edit a short video, design graphics, make and modify a 3D model, and create a small interactive videogame environment. The course culminates with students designing digital portfolios of the work they create in this course. (Fall and Spring)

**DMS 104 Design in the Digital Age.** Designing digital products and services requires a process of “interaction design,” which is a wholly new discipline that moves beyond previous fads of simply making digital things that look like physical world objects. Since there is no known formula for creating great UI/UX we explore the need to consider interactivity as a design process, moving from initial ethnographic research through ideation and design and the many steps that lead to final delivery and presentation. Mastery of this process prepares DMS students to undertake their senior capstone project as well as effectively develop other creative and entrepreneurial ideas/ventures. (Fall and Spring)

**Technology/Production Courses**

For relevant courses related to technology/production, please see the program website and/or the digital media studies program advisor.

For more information, go to [sas.rochester.edu/dms/](http://sas.rochester.edu/dms/).

## EARTH AND ENVIRONMENTAL SCIENCES



*“Mont Blanc yet gleams on high—the power is there,  
The still and solemn power of many sights,  
And many sounds, and much of life and death.  
In the calm darkness of the moonless nights,  
In the lone glare of day, the snows descend!  
Upon that Mountain”*

—Percy Bysshe Shelley

### Information about the Department

The department offers courses leading to degrees in the geological and environmental sciences. In addition, minor programs and a number of clusters allow students in other fields to explore topics such as the formation and evolution of the Earth and solar system, as well as past and current changes in Earth’s atmosphere, oceans, and global climate. Undergraduates are strongly encouraged to take part in departmental research activities, and such experience is typically included in upper-level undergraduate courses. Research fields represented include geophysics, geochemistry, structural geology, sedimentology, environmental geology, oceanography, and climate science. The department is equipped with several state-of-the-art research laboratories that complement active field-based programs. Undergraduate research provides an excellent opportunity for students to work closely with faculty and graduate students.

The department also considers field experience to be a valuable part of geological training, and field excursions are incorporated into the schedule of several undergraduate courses. Students in EES 101 use the local glacial geology as a guide to recent Earth evolution, students in EES 102 explore the active geological processes that are shaping California, and students in EES 206 use the geology of the

Adirondack Mountains of New York to understand the formation of the North American continent. Opportunities for students to be involved with field-based research are also available. Recent examples include involvement of undergraduates in scientific expeditions to the Arctic, Tibet, East Africa, southern Africa, the Andes, the western United States, and cruises off the Atlantic coast to study the Earth’s past climate and tectonic processes.

### Departmental Advice for First-Year Students

The Department of Earth and Environmental Sciences offers programs leading to a BS or BA degree. The BS programs include geology and environmental science; BA programs are available in geology and environmental studies.

The BS program in geology is designed to give students a sound preparation for top graduate programs and a professional career. It contains a greater proportion of related science courses than the BA program. A typical first semester program for a BS student would be chemistry, geology, calculus, and an elective. Beyond the second year, specialty tracks within the major enable students to emphasize the relationships between geology, biology, geology and/or chemistry, and are structured to provide students with flexibility to select upper-level courses in the department that best align with individual interests.

The BS in environmental science provides a broad basis in the natural sciences and their applications to processes and problems in the environment. This degree is intended for students who are interested in a career in environmental research. Students going through this program will be able either to seek employment directly or to go on to programs that offer advanced degrees in environmental science. A typical first-semester program includes calculus, chemistry and/or biology, and an elective.

The BA program in geology offers students more freedom in selecting courses, especially in the social sciences and humanities, while providing them with the minimum background required for graduate studies. First-year students interested in this program are not required to take certain courses for their first semester but should take chemistry, geology, and mathematics during the first two years.

The BA in environmental studies combines natural science courses providing a basic understanding of environmental problems and social science courses that bear upon management of these problems. This program is intended for students who are interested in environmental policy and management. Students who complete this program typically go into fields such as environmental law or public policy. Students might take chemistry, calculus, economics or political science, and an elective in the first semester.

The department also offers minors in geology and environmental geology to enable students majoring in other disciplines to develop an understanding of one area of geology.

### Advanced Placement (AP)

Students who receive a 4 or 5 on the AP Environmental Science exam are awarded credit for EES 103.

### International Baccalaureate (IB)

Geography—Students who receive a higher-level exam score of 5 or better are awarded credit for EES 101.



## Courses

### Fall Semester

**EES 101 Earth System Science.\*** The Earth is a complex of interrelated systems, all of which fall under the umbrella of Earth science. This course is an introduction to some of Earth's systems: the exosphere (the universe and everything in it, including the Earth); the geosphere (geology, the study of rocks and the history they record); hydrosphere (liquid and frozen water moving on and under the surface of the Earth); the atmosphere (the gas envelope blanketing the Earth); and the biosphere (the relationships of living things on Earth). These systems interact, and a perturbation in one sphere may have lasting effects on others (for example, global climate change). This course includes a laboratory in which students gain hands-on experience with Earth materials as well as at least one in-lab field trip.

**EES 105 Introduction to Climate Change.\*** This course explores the Earth's dynamic climate system through lectures, discussions, and computer-based modeling of climate processes. The course is designed to be accessible to all students. We work toward an understanding of several fundamental and important questions: What are the main factors that determine the Earth's climate? What forces can drive climate to change? What can we learn from climate change in the Earth's distant past, when our planet experienced periods of both extreme cold and warmth? How do we know that our climate is now changing? What can we expect from the Earth's climate in the near future, and how would it affect us?

### Spring Semester

**EES 100 Introduction to Oceanography.\*** This class is in basic oceanography. Oceanography is the study of marine systems from a physical, chemical, geological, and biological point of view. In this class, we explore the formation and structure of the oceanic basins, the geochemistry of seawater and sediments, the ocean circulation patterns, and the composition and distribution of biological populations as a function of different physical and chemical variables. At the end of the semester, we discuss some special topics, such as global warming and ocean acidification, overfishing, and coastal pollution.

**EES 103 Introduction to Environmental Science.\*** This course provides a comprehensive overview of fundamental scientific concepts in environmental science and the interactions between humans and their environment. Modules address ecological and human systems; air and water; energy and climate; and food and waste. The goal is to provide students with critical thinking skills and a level of scientific literacy for further study of environmental issues and to create informed and engaged citizens and consumers.

**EES 201 Evolution of the Earth.\*** Historical geology encompasses 1) the dynamic history of the physical earth: the development of landforms, rise and fall of ancient seas, movements of continents, etc., and 2) the evolution of historical geology, such as paleontology, sedimentology, stratigraphy, geochronology, and plate tectonics; and a chronological survey of earth and life history, emphasizing the evolution of North America.

For more information, go to [sas.rochester.edu/ees/](http://sas.rochester.edu/ees/).

## EAST ASIAN STUDIES (MULTIDISCIPLINARY STUDIES CENTER)



### Information about the Program

The East Asian studies major is an interdisciplinary approach to the languages, deep history, and uncommonly rich culture of this important part of the world. Students in this major study Chinese, Japanese, or Korean for at least two full years, and they must take classes in at least three—and they can take classes in four—departments in order to achieve a broad and deep understanding of East Asia.

Students who complete the major in East Asian studies will have a broad knowledge of the major historic developments, cultures, literary and artistic expressions, philosophies, religions, and economies and politics of the region. They will be able to synthesize their knowledge of the region across disciplinary perspectives, and they will have an intermediate-level proficiency in either Chinese, Japanese, or Korean.

The East Asian studies program also offers a minor that provides students with a rigorous interdisciplinary overview of the history and culture of East Asia. The minor is designed for students who have a strong interest in East Asia but who are unable to or choose not to pursue the study of an East Asian language.

#### Program Advice for First-Year Students

Students begin their study of East Asia by taking three introductory courses, arranged historically, on the literature, history, religions, visual culture, and other foundational aspects of the region. Students pursuing the major are also encouraged to begin their prerequisite language studies.

\*Courses that are part of clusters offered by the Department of Earth and Environmental Sciences.



## Courses

### Fall Semester

#### *Prerequisite Language Courses*

(required for East Asian studies majors but not minors)

**CHI 101 Elementary Chinese I.** *Students must register for both lecture and recitation.* This course is designed for beginners of Chinese. It introduces students to the sounds, basic sentence structures, and the writing system of Mandarin Chinese. *Pinyin*, the phonetic translation system, is taught and required throughout the course. Emphasis is on developing listening and speaking skills as well as building a vocabulary based on 400 ideographic characters. (6 credits)

**JPN 101 Elementary Japanese I.** *Students must register for both lecture and recitation.* Designed to help beginners acquire a basic command of modern Japanese. The classes are conducted in English for the grammar lecture, the recitation in Japanese. In the beginning, students master *Hiragana* and *Katakana* writing systems. As the course progresses *Kanji* Chinese characters are also introduced. Classes emphasize reading, writing, listening, and speaking. Requirements include regular assignments, quizzes, lesson tests, and final exam. Textbooks: 1) *Genki I: An Integrated Course in Elementary Japanese* by Eri Banno Yutaka Ohno, et.al. (the *Japan Times*) and 2) *Course Workbook* by Shino. (6 credits)

**KOR 101 Elementary Korean I.** *Students must register for both lecture and recitation.* This course is designed for students who have no or limited background in Korean. It introduces students to the sounds, basic sentence structures, and the writing system of Korean. Emphasis is on developing listening and speaking skills as well as building vocabulary. Cultural aspects of the language are also focused on enhancing students' understanding of the language. (4 credits)

#### *Foundational Survey Courses*

**HIS 145 Modern Japan.** This course covers Japanese history from the 1800s to the present. During these 200 years, Japan went through a roller coaster of events: the Meiji Restoration, industrialization, fascism, wars, atomic bombs, an economic miracle, a "lost" decade, and, recently, a devastating tsunami. The Japanese paradox of Chrysanthemum and Sword still awaits explanation. Come join me in this journey of books, archives, films, and anime in search of modern Japan.

*Note: The following course may have appropriate content but has not been officially approved for the East Asian studies program. Please see one of the East Asian studies faculty advisors for approval.*

**REL 175 Religion and Chinese Society.** This course examines the complicated relationship between religion and society in China. It takes a sociological approach, emphasizing that religion should be studied as a social phenomenon that closely interacts with the development of society at large. The focus is on contemporary times from the end of the 19th century through present. During this period, China experienced tremendous change. This course introduces how such change impacted and was expressed through religion, religiosity, and religious politics.

### Spring Semester

#### *Prerequisite Language Courses*

(required for East Asian studies majors but not minors)

**CHI 102 Elementary Chinese II.** *Students must register for both lecture and recitation.* This course is the continuation of Chinese 101. Knowledge of *Pinyin* is required. The focus continues to be on developing listening and speaking skills with an increasing emphasis on reading and writing in ideographic characters. It aims to build a vocabulary based on 500 characters. (6 credits)

**JPN 102 Elementary Japanese II.** *Students must register for both lecture and recitation.* Sequel to JPN 101. Lecture and recitation designed to help the students at the late beginning level acquire a practical command of modern Japanese in all areas. Although the main emphasis is still on speaking and listening, students have more opportunities for writing than in JPN 101. The classes are conducted in both Japanese and English. The students master, among other things, *keigo* (polite language), female versus male speech style, and "direct" style verbals. Textbooks: 1) *Genki I: An Integrated Course in Elementary Japanese* by Eri Banno Yutaka Ohno, et.al. (the *Japan Times*) and 2) *Course Workbook* by Shino. (6 credits)

**KOR 102 Elementary Korean II.** *Students must register for both lecture and recitation.* This course is the continuation of KOR 101. This course offers students the opportunity to expand their vocabulary and to improve further conversational and grammatical skills beyond those learned in KOR 101. Focus is on developing listening and speaking skills for everyday personal communication and developing sociocultural knowledge for interactional competence in Korean. (4 credits)

**For more information, go to [rochester.edu/college/msc/east-asian.html](http://rochester.edu/college/msc/east-asian.html).**

## ECONOMICS



*“It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner but from their regard to their own interest.”*

—Adam Smith

### Information about the Department

The undergraduate program emphasizes the understanding of modern tools of economic analysis and their application to contemporary policy issues. Those concentrating in economics have the opportunity to pursue a BA degree in economics or financial economics. Students seeking more rigorous training have the opportunity to pursue an honors degree in economics. Graduates are prepared for positions in business and government; for professional schools of business administration, including the 3-2 MBA program with the William E. Simon Graduate School of Business Administration; for graduate work in economics or public policy; for law school; and for PhD programs in economics.

#### Departmental Advice for First-Year Students

Students planning to major in economics should complete at least three of the following courses by the end of their sophomore year: ECO 108; ECO 207 or ECO 207H; ECO 209 or ECO 209H; a semester of statistics (ECO 230 is recommended; STT 213 or MTH 203 is acceptable). By the end of your sophomore year, you should complete at least one semester of the calculus sequence. One year of calculus is required to major in economics (161–162 is preferred; 141–143 is acceptable).

#### Advanced Placement (AP)

Students who have received a score of 4 or 5 on the AP exam in Microeconomics and a 3, 4, or 5 on the Macroeconomics examination will be given credit for ECO 108.

#### International Baccalaureate (IB)

Economics—Students who receive a higher-level exam score of 4 are placed into ECO 207. No credit is awarded. Students who receive a score of 5 or better on a higher-level exam are placed into ECO 207 and awarded credit for ECO 108. No credit is granted for subsidiary-level exams. A-level credit: Students who complete the A-level exam with a grade of “A” will receive credit for ECO 108.

#### Clusters

The department offers clusters in a number of areas of economics, including macroeconomics, applied economics, and theoretical economics. For most students, ECO 108 is a required course for a cluster.

### Courses

**ECO 108 Principles of Economics.** This course is an introduction to the fundamental concepts of both microeconomic theory (supply and demand, cost and production, prices in markets for individual commodities) and macroeconomic theory (national income, unemployment, and inflation), with applications of theory. It gives a student preparation for subsequent economics courses. This course is required for an economics concentration and for all economics clusters. (Fall and Spring)

**ECO 207 Intermediate Microeconomics.** This course develops the fundamental building blocks of economic theory, enabling the student to gain an understanding of how economists evaluate economic problems and policies. The focus throughout is on how economic agents make choices and how prices serve as a key mechanism in the allocation of resources. Topics covered include competition, monopoly, taxes, subsidies, etc. Prerequisites: ECO 108 or equivalent. This course is required for an economics concentration and all clusters. (Fall and Spring)

**ECO 207H Honors Intermediate Microeconomics.** Rigorous treatment of ECO 207 for students pursuing the honors degree and valuable for those students considering pursuing a PhD in economics. Prerequisites: one semester of calculus, excellent performance in ECO 108 or equivalent, instructor’s permission. (Spring)

**ECO 230 Economic Statistics.** This course provides an introduction to basic probability and statistical theory for estimation and hypothesis testing, with emphasis on issues that arise when dealing with economic data. In the process, data analysis methods through the use of computer software are introduced. This course fulfills the statistics requirement for economics majors and should be completed by the sophomore year. (Fall and Spring)

**For more information, go to [sas.rochester.edu/eco/](http://sas.rochester.edu/eco/).**

## ELECTRICAL AND COMPUTER ENGINEERING



*"Few things are impossible to diligence and skill."*

—Samuel Johnson

### Information about the Department

The Department of Electrical and Computer Engineering is home to programs making significant contributions to fields as diverse as health, energy, national security, information management, and even entertainment. In addition to their academic studies, students also have many opportunities to participate in department research programs as well as student-run projects such as the Solar Splash and Mini Baja teams.

#### Departmental Advice for First-Year Students

The electrical and computer engineering curriculum is based upon a foundation of mathematics and the physical sciences with a total of five mathematics and three physical science courses required. Our department's curriculum provides a broad education in the basics of electrical and computer engineering as well as in-depth studies and design experiences in one or more areas such as signals and communications, computer architecture, or electronics and integrated circuit design. Thus, after completing the baccalaureate degree, our graduates are prepared to enter the ECE profession directly or to pursue further study at the graduate level. The flexibility in the program also offers students the opportunity to prepare for careers in law, business, or medicine and other alternative career paths.

Entering students with an interest in pursuing the ECE program are assigned faculty advisors to help with academic program planning throughout their four years of studies.

#### Typical First-Year Program

##### Fall Semester

MTH 161 or MTH 141  
WRT 105  
ECE 101 or EAS 10X  
(*EAS 108 recommended*)  
Natural science or elective

##### Spring Semester

MTH 162 or MTH 142  
PHY 121  
ECE 112  
Elective

### Courses

**EAS 108/ECE 101 Introduction to Electrical and Computer Engineering.** A general, high-level understanding of workings of modern computing systems from circuit to computing system architecture to programming. ECE101 is not a required course. Lecture materials are covered eventually in subsequent courses. It is intended to introduce you to (a subset of) principle topics in computer system designs. There is an emphasis on hands-on experience to give you a "feel" for the materials that are discussed in more depth later on.

**ECE 112 Logic Design.** Students are exposed to combinational logic elements, including all of the following: logic gates; Boolean algebra; Karnaugh maps; conversion between number systems; binary, tertiary, octal, decimal, and hexadecimal number systems; and arithmetic on signed and unsigned binary numbers using 1's and 2's complement arithmetic. Also covered are programmable logic devices, synchronous finite state machines, state diagrams, FPGA, A&S and coding logic in VHDL. Prerequisites: MTH 162 OR MTH 141 OR MTH 171.

For more information, go to [hajim.rochester.edu/ece/](http://hajim.rochester.edu/ece/).

## ENGINEERING SCIENCE



*"The opportunities of man are limited only by his imagination. But so few have imagination that there are ten thousand fiddlers to one composer."*

—Charles F. Kettering

### Information for Interested Students

At its core, engineering is about deconstructing a problem, designing a solution, and tinkering with your solution until you have reached a desired outcome. Students taking courses at the Hajim School are challenged to nurture their ingenuity and become technologically savvy problem solvers and graduate well prepared for advanced studies as well as professional employment.

In her 2016 investiture remarks, Dean Wendi Heinzelman asserted, "I believe that all educated citizens in the 21st century, regardless of major or intended career, need to have an understanding of technology, of data analysis, system design, and computer systems. . . . I am



also a strong believer in the benefits of cross-disciplinary thinking. The disciplines outside of engineering, in particular the humanities and social sciences, have a lot to teach us about critical discourse.” Although she was talking about her vision for the Hajim School, she could have just as easily been talking about the benefits of a bachelor of arts degree in engineering science, which provides students with a multidisciplinary major that emphasizes understanding and application of engineering and scientific and mathematical principles. Students majoring in engineering science achieve depth and breadth in the field and are able to function across disciplines as a result of the clusters they complete in both the humanities and social sciences divisions of the Rochester Curriculum.

### Advice for First-Year Students

Our introductory courses, EAS 10x, are accessible to engineering majors and non-majors alike. These courses focus on the fun side of engineering, from building bridges to making more-energy-efficient devices. While completion of at least one EAS 10x course is required for most majors in the Hajim School, the engineering science major offers considerable flexibility and permits students to develop individual plans of study to meet their own educational goals.

In addition to taking core courses in mathematics, physics, chemistry, and computer science, students study thermodynamics, fluid dynamics, optics, mechanics, signals, and circuits. Their curriculum is rounded out with four upper-level Hajim School courses of their choosing, and one cluster in each of the humanities and social sciences divisions of the Rochester Curriculum. Careers in patent law, technical writing, science consulting, and technical sales as well as science and engineering education are possible career outcomes.

### Typical First-Year Program

#### Fall Semester

MTH 141 or MTH 161  
CHM 131/137/172 or CSC 171  
WRT 105 or elective  
EAS 10X course

#### Spring Semester

MTH 142 or MTH 162  
PHY 113 or PHY 121  
CSC 171 or CHM 132  
WRT 105 or elective

## Courses

### EAS 101/BME 101 Introduction to Biomedical Engineering.

Students receive an overview of the multidisciplinary field of biomedical engineering, including application of elementary engineering principles to the analyses of physiological systems. By learning about topics such as biomechanics, cell and tissue engineering, biosignals, biosystems, bioinstrumentation, medical imaging, medical optics, and bioethics, first-year students will see the crucial role engineers play in the development of medical machinery. This course includes a weekly laboratory and an introduction to the use of computers as tools for solving engineering problems. (Fall)

**EAS 102/CHE 150 Green Energy.** First-year students enrolled in this course study the issues of energy production, conversion, and utilization. The first half of the course covers energy and power metrics, material and energy balances, and the fundamental laws of thermodynamics. The remainder of the course examines traditional and alternative energy sources, energy distribution, and energy

utilization. Course activities include weekly homework assignments, exams, and a project. Emphasis is on assumption-based problem solving. (Fall)

**EAS 103/AME 140 Introduction to Audio Music and Engineering.** The course provides an introduction to the science and technology of audio. Students learn about the vibration of strings, musical tuning systems, overtones and timbre, and modes of oscillation through the concept of a guitar. Fourier analysis, transducers, and passive electrical components and circuits are introduced when discussing amps and audio components. Hands-on projects introduce the fundamental concepts of electronics, including voltage, current, resistance and impedance, basic circuit analysis, ac circuits, impedance matching, and analog signals. The course then introduces basic digital signal processing concepts, where they use Arduinos and Pure Data to learn about conversion of sound to digital format, frequency analysis, digital filtering and signal processing, and musical sound synthesis.

**EAS 104/ME 104 The Engineering of Bridges.** This course is an introduction to the art of bridge building based on the study of the engineering and technological problems involved in the design, construction, and collapse of bridges from antiquity to the present time. By studying several case studies of major historical bridges selected for their structural significance, students learn how to calculate the forces acting on structural elements, how these forces depend on the bridge structural form, how the form itself is conditioned by the structural materials, and how forces are measured with electromechanical instrumentation. The study includes fundamental notions of mechanics, strength of materials, structural behavior, instrumentation failure analysis, and design optimization. Working in teams, students use constructive experimental models as well as computer-aided programs to design, build, instrument, and test realistic bridge projects. (Fall)

**EAS 105/OPT 101 Introduction to Optics.** Starting with a discussion of the properties of light (refraction, imaging, diffraction, and interference), the course also reviews the development of the microscope, telescope, laser, Internet, information storage and display, and medical applications. While covering the fundamentals of optics and discussing engineering and applied sciences in the real world, this course also explores how optics interweaves with other Hajim School disciplines. (Fall)

**EAS 108/ECE 101 Introduction of Computing Systems.** This project-based course is designed to give students a general, high-level understanding of the workings of modern computing systems from circuit to computing system architecture to programming. It is intended to introduce students to (a subset of) principle topics in computer system designs. There is an emphasis on hands-on experience to give a “feel” of the materials that will be discussed in more depth in subsequent ECE courses. (Fall)

**EAS 141 Basic Mechanical Fabrication.** This half-semester, two-credit course teaches students the safe and effective use of basic machine tools such as lathes, mills, band saws, and drill presses. Students complete a number of projects that utilize these principles. Grades are based on the successful completion of these projects. Read more about this course at [www.hajim.rochester.edu/news/eas\\_141.html](http://www.hajim.rochester.edu/news/eas_141.html). (Spring)

**EAS 142 Introduction to Microprocessors and Interfacing.** This course introduces students to microprocessor programming and interfacing using the Arduino Uno microprocessor platform. It stresses hands-on learning and instructs students in basic processing of microprocessors, sensor interfacing, and motion control. The first part of the class introduces microprocessor programming and interfacing. During the second part of the class, students work together in teams to propose and execute an independent project. Grading is based on class participation, the execution of the independent project, and the project documentation. All necessary supplies are provided to the students for the course. Students interested in keeping their Arduino or doing work outside of the class will need to purchase their own Arduino Uno (~\$30) and other supplies.

**EAS 143 Introduction to Solid Modeling.** This is an applied course introducing computer-aided design (CAD) using OnShape, a web-browser-based CAD program. Students learn the basics of generating three-dimensional objects, how to combine individual parts into larger assemblies, and how to draft parts and assemblies; they work in small groups to complete an advanced modeling project. Additive manufacturing (3-D printing) is discussed, and the final project will be 3-D printed for each student. At the end of the course, students are able to manifest their own ideas and designs in the CAD workspace utilizing spatial reasoning and engineering design principles, a useful skill in all engineering disciplines. (2 credits)

For more information, go to [hajim.rochester.edu/academics/options/engineering-science/](http://hajim.rochester.edu/academics/options/engineering-science/).

## ENGLISH



*Macbeth and the Weird Sisters* by Henry Fuseli

*Tell all the truth but tell it slant—  
Success in Circuit lies  
Too bright for our infirm Delight  
The Truth's superb surprise*

—Emily Dickinson

## Information about the Department

The Department of English offers undergraduates the chance to explore a wide array of literary works—poetry, drama, fiction, and nonfiction—from the traditions of British, American, and Anglophone literature. We have richly varied offerings in creative writing, in the study of film and other media, and in journalism, rhetoric, and theater. Our classes encourage exploratory thinking and conversation, always aiming to increase the students' knowledge, their skills in reading and critical analysis, and their strengths as writers. The department offers opportunities for independent research and internships within both the University and the Rochester community, and we maintain close connections with other undergraduate programs in comparative literature, film studies, women's studies, African and African-American studies, theater, and literary translation studies.

Students wishing to major in English can choose from four distinct tracks: British and American Literature; Creative Writing; Theater; and Language, Media, and Communication. Double majoring in English and in another discipline—astronomy or philosophy, political science or music—is common for our students. Many combinations are possible. The English Honors Program offers students the chance to write an extended honors thesis—critical or creative—in their senior year. We also offer minors in four areas: English literature, creative writing, journalism, and theater, as well as a diversity of clusters for students seeking to fulfill the cluster requirement in the humanities. Students with questions about any of these programs or possibilities should contact the department's director of undergraduate studies.

### Departmental Advice for First-Year Students

The English courses listed below are intended to introduce students to the study of literature, language, film, theater, and creative writing. They will allow students to discover the many ways of approaching imaginative works. Classes such as ENG 112, 113, 114, and 115 provide broad surveys of English and American literature—and their historical backgrounds—and are especially useful to those students considering the major in English literature or creative writing. Two of these classes are in fact required for these tracks in the major, and they can also be counted for requirements in the Theater and Language, Media, and Communication tracks.

It's important to note, however, that neither these nor any of the 100-level classes we offer are in any way prerequisites for upper-level courses. First-year-students should be aware that, in fact, the department has no hard and fast rules that prohibit them from taking most English courses at the 200 level, except for 200-level creative writing courses. If an upper-level course on, say, Shakespeare, the Victorian novel, modern poetry, post-Colonial literature, or contemporary film looks interesting, you should consider enrolling—although you might want to check with the professor if you have any questions about your preparedness.

For any additional questions about English courses or about the English majors, minors, and clusters, students should contact the director of Undergraduate Studies in English.

**Advanced Placement (AP)**

Students who have received a score of 4 or 5 on the AP exam in English Literature will be awarded 4 elective credits of English (not for use toward an English major) upon earning a “B” grade or better in an English literature course.

**International Baccalaureate (IB)**

**English**—Students who receive a higher-level exam score of 6 or better are awarded 4 hours of elective English credit (not for the major) after completion of an English literature course with a grade of C or better. No credit is granted for subsidiary level exams.

**Theater Arts**—Students who receive a higher-level exam score of 6 or better are awarded 4 hours of elective English credit (not for the major).

**Clusters**

American and African-American Studies; Creative Writing; Gender and Writing; Great Books, Great Authors; Literature and Cultural Identity; Media, Culture, and Communication; Medieval Studies; Modern and Contemporary Literature; Novels; Plays, Playwrights, and Theater; Poems, Poetry, and Poetics; Theater Production and Performance.

**Courses***Introductory and Gateway Courses*

**ENG 100 Great Books: African Literatures of Migration.** We live in a time when migrations seem to dominate world news. People escaping collapsing societies, searching for better lives. This course charts the hopes, fears, and aspirations of those who leave—from African perspectives. We read a range of fiction and poetry from across the continent, from canonical writers like Chinua Achebe and Tayeb Salih to some of the acclaimed new voices of our century. (Fall)

**ENG 101 Maximum English.** “English” is a little word for lots of things. Is it literature you want today or creative writing? film? theater? journalism? debate? Maximum “English” introduces students to all these areas and to our unique resources for studying and enjoying them. (Fall)

**ENG 112/REL 140/CLA 140 Classical and Scriptural Backgrounds.** Explores the great tradition, from Homer, Greek drama, Plato, and Virgil to the Bible and Dante. May count toward completion of the cluster in Medieval Studies or Great Books, Great Authors. (Fall)

**ENG 113 British Literature I.** An introductory study of early British literature, its forms and themes, and the development of our literary tradition. May count toward completion of the clusters in Medieval Studies or Great Books, Great Authors. (Fall)

**ENG 114 British Literature II.** Major themes and central ideas in British literature of the 18th, 19th, and 20th centuries are discussed. May count toward completion of the cluster in Great Books, Great Authors. (Spring)

**ENG 115 American Literature.** Significant achievements by American writers of poetry, fiction, and other prose are covered. May count toward completion of the cluster in American and African-American Studies. (Spring)

*Film and Media Courses*

**ENG 117/FMS 132/AH 136 Introduction to the Art of Film.** This course presents the concepts of film form, film aesthetics, and film style while remaining attentive to the various ways in which cinema also involves an interaction with audiences and larger social structures. May count toward completion of the cluster in Language, Media, and Communication or Modern and Contemporary Literature. (Fall)

**ENG 118/FMS 131/AH 102 Introduction to Media Studies.** Introduces students to the theory and practice of media studies. We look at a range of both media and historical tendencies related to the media, including manuscript culture, print, and the rise of the newspaper, novel, and modern nation-state; photography, film, and television and their respective differences as visual mediums. (Spring)

*Creative Writing Courses*

**ENG 121 Creative Writing: Fiction.** Our goal in this introductory workshop is to strengthen writing skills and expand our sense of the possibilities of imaginative fiction. We examine the components of narrative in stories by diverse modern and contemporary writers. (Fall and Spring)

**ENG 122 Creative Writing: Poetry.** An introductory course in the art of writing poetry. The course is conducted in a workshop format, and instructor permission is required. (Fall and Spring)

**ENG 125 Speculative Fiction.** An introductory course in the writing of speculative fiction. Instructor permission required. (Spring)

*Language, Media, and Communication Courses*

**ENG 131 Reporting and Writing the News.** A laboratory course (requiring typing) on the fundamentals of gathering, assessing, and writing news. May count toward completion of the cluster in Language, Media, and Communication. (Fall, two sections)

**ENG 133 Editing.** Study of newspaper and online editing with emphasis on news decision making, copy editing, ethics, and First Amendment issues such as libel. Applicable English cluster: Media, Culture, and Communication. (Spring)

**ENG 134 Public Speaking. Basic public speaking is the focus of this course.** Emphasis is placed on researching speeches, using appropriate language and delivery, and listening critically to oral presentations. The course utilizes instructor Curt Smith’s experience as a former White House presidential speechwriter. (Fall and Spring)

**ENG 135 Introduction to Debate.** The purpose of this course is to give students an appreciation for and knowledge of critical thinking and reasoned decision making through argumentation. Students research both sides of a topic, write argument briefs, and participate in formal and informal debates. (Fall and Spring)



**First-year students are also welcome in 200-level ENG courses that do not require permission of instructor. Please see [www.sas.rochester.edu/eng](http://www.sas.rochester.edu/eng) for full ENG course listings.**

ENG 200 History of the English Language (Fall)

ENG 201 Old English (Spring)

ENG 203 Medieval Drama (Spring)

ENG 204 Chaucer (Fall)

ENG 206 Medieval Otherworlds (Fall)

ENG 206 The Monstrous Feminine (Fall)

ENG 210 Shakespeare (Fall)

ENG 215 The Early English Novel (Spring)

ENG 217 Imagining Reality in the 18th Century: Samuel Johnson and Friends (Spring)

ENG 221 Victorian Literature (Fall)

ENG 222 Nineteenth-Century Novel (Fall)

ENG 223 Austen, Eliot, and Woolf (Spring)

ENG 228 African American Autobiography (Fall)

ENG 228 Harlem Renaissance (Fall)

ENG 235 Twentieth-Century Drama (Fall)

ENG 238 Caribbean Gothic (Fall)

ENG 238 Anglophone Digital Literatures (Spring)

ENG 238 Contemporary African Novel (Spring)

ENG 238 Modernism (Spring)

ENG 241 Lyric Poetry (Spring)

ENG 243 The Brontës (Fall)

ENG 244 Studies in Literary Tradition (Spring)

ENG 249 The Witch

ENG 255 Film History: Early Cinema (Fall)

ENG 277 Screen Writing (Spring)

ENG 284 Orality and Literature (Fall)

ENG 286 Presidential Rhetoric (Fall and Spring)

### *Theater Courses*

The University of Rochester International Theatre Program produces four major productions annually as well as other events (including a student One Act Play Festival). The program also offers students classes in acting, voice, and movement; playwriting; directing; and backstage/technical arts. An English major with theater minor is available. Detailed information about the International Theatre Program can be found at [www.sas.rochester.edu/theatre](http://www.sas.rochester.edu/theatre).

**ENG 123 Playwriting.** An introductory course devoted to the understanding and execution of dramatic writing that is unique to the theater. May count toward completion of the cluster in Theater Production and Performance. (Fall)

**ENG 170/171 Technical Theater.** An introductory course on the theories, methods, and practice of set construction, including power tools, rigging, stage lighting, drafting, sound, and scene painting. Lab participation in theater program productions is required. May count toward completion of the cluster in Theater Production and Performance.

**ENG 172/173 Introduction to Stage Lighting and Sound.** The course undertakes to introduce students to the various elements of theater design. Lighting techniques, sound design, and set design are all covered from time to time. May count toward completion of the cluster in Theater Production and Performance.

**ENG 174/175 Acting Techniques and Acting Lab.** Training in the techniques by which individual actors set forth the characters recorded in dramatic texts. May count toward completion of the cluster in Theater Production and Performance.

**ENG 176/177 Voice and Movement for the Actor.** An introductory course on voice and movement for the actor, concentrating on the ability of the actor to maximize the use of the body and voice to express emotion and character. May count toward completion of the cluster in Theater Production and Performance.

**ENG 178/179 Design for the Stage.** Sound addresses both conceptual and practical aspects of the creation of sound for live performance. Students acquire an understanding of the history and theory of sound design, with emphasis on the creative association of sound and image; the process of developing a well-crafted, professional design from script to technical rehearsal to performance; and hands-on experience with tools and techniques used to build a sound design and execute it on stage.

**ENG 180 Directing (and Directing Lab).** Introductory directing techniques for aspiring directors. Explores the nature of the theatrical events and investigates the nature of conceptualization, visualization, text analysis, action, and design as they pertain to the director's craft. In conjunction with a weekly scheduled lab. May count toward completion of the cluster in Theater Production and Performance. (Fall)

**ENG 290/291 Plays in Production.** Set building, prop and costume development, and publicity for current production. May count toward completion of the cluster in Theater Production and Performance.

**ENG 292/293/294/295 Plays in Performance.** For actors and stage managers working on the current production. May count toward completion of the cluster in Theater Production and Performance.

**ENG 296/297 Stage Management.** Students in stage management get an in-depth introduction to and immersion in stage managing a theatrical production. In addition, the course covers all areas of management skills, safety procedures, technical knowledge, and paperwork. Students are expected to serve as assistant stage manager or production stage manager on one (or both) theater program productions in their registered semester. May count toward completion of the cluster in Theater Production and Performance.

**ENG 298/299 Performance Lab: Production.** Mandatory acting lab for students in ENG 291. A lab tutorial providing technical help for actors and stage managers in Plays in Performance (Eng 292/3/4/5). (2 credits)

**For more information, go to [sas.rochester.edu/eng](http://sas.rochester.edu/eng).**

## ENVIRONMENTAL HUMANITIES (MULTIDISCIPLINARY STUDIES CENTER)



*"It's not climate change—it's everything change."*

—Margaret Atwood

*"A fine paradox emerges. Global environmental change is too elusive to grasp yet too profound to ignore."*

—Mitchell Tomashow

### Information about the Program

Environmental humanities is the study of ecological issues with humanities methodologies of interpretation, critique, historiography, and creative inquiry. At the University of Rochester, the Environmental Humanities Program offers courses in English, art history, studio art, history, philosophy, film and media studies, digital media studies, and more.

Courses in environmental humanities teach students how to investigate the roles of culture, history, and imagination in shaping our understandings of ecological issues and to interrogate how environmental problems and solutions have been narrated, defined, identified, and framed. Questions that animate the University of Rochester's environmental humanities courses include: What is nature? What is as an environmental fact? How are facts experienced? How does history inform our understanding of contemporary environmental issues? How can we theorize modernity and modernization from an environmental perspective? How can writers, artists, and philosophers help us think through the roles of race, class, sexuality, and social justice in environmental issues? What does it mean to be an inhabitant of the new geologic era of the Anthropocene? How have the sciences defined how ecological crises, such as climate change, are perceived? A goal of the environmental humanities program is to emphasize the imagination's role in understanding alternative, marginalized environmental perspectives and in developing new possibilities and practices that have not yet been articulated.

#### Program Advice for First-Year Students

Courses offered by the environmental humanities program and suggested for first-year students are listed below. There are also additional courses in environmental humanities provided by other

departments, such as philosophy; history; art history; studio art; and gender, sexuality, and women's studies. Students interested in additional courses are encouraged to contact the environmental humanities program director for more information.

### Courses

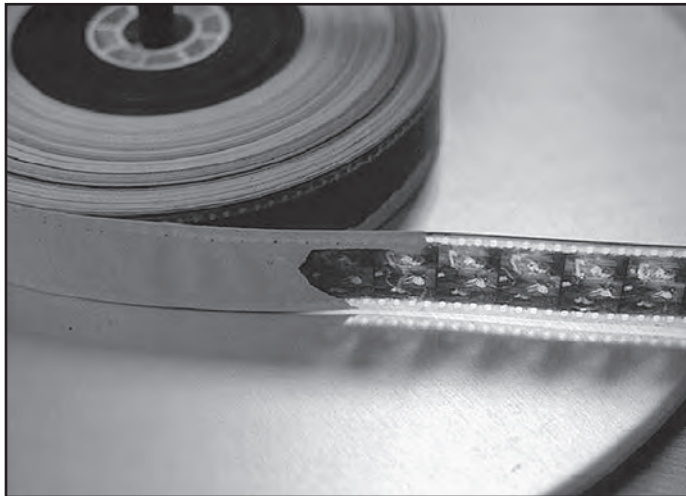
**BIO 104K Ecosystem Conservation and Human Society.** The course examines a new approach in conservation biology that identifies and places economic value on the services that natural ecosystems provide. Such services are basic to sustainable societies and include clean water and air, waste decomposition, pollination, and farmland productivity. Major themes include an overview of other approaches in conservation biology, a review of the services that ecosystems provide, ways the value of these services are determined, and how this novel approach is influencing economic and political policy at local, national, and international levels. (Fall)

**PHL 103 Contemporary Moral Problems.** An introduction to moral philosophy as applied to current topics. Some questions to be explored: Is torture morally permissible in the fight against terrorism? Is it okay to destroy embryos for stem cell research? Can abortion sometimes be justified? How? Is active euthanasia ever permissible? Is capital punishment justifiable in principle? In practice? How far does our moral duty to aid distant strangers extend? What sorts of political and socioeconomic principles are morally justifiable? Do animals have moral rights? How should we understand the meaning and value of life and death? We also explore related general questions: Is it always possible for a good enough end to justify bad means? What is the relation, if any, between morality and religion? Are there objective facts about right or wrong, or is morality ultimately subjective or relative to cultures or times? Are there situations in which every available action is wrong? (Fall and Spring)

*Many departments that contribute to the interdisciplinary environmental humanities minor offer courses that are appropriate for first-year students. Students should check with departments if they are interested in 200-level courses not listed here.*

**For more information, go to [rochester.edu/college/msc/environmental-humanities.html](http://rochester.edu/college/msc/environmental-humanities.html).**

## FILM AND MEDIA STUDIES PROGRAM



*“And do you see men passing along the wall carrying all sorts of vessels . . . Some of them are talking, others silent. You have shown me a strange image, and they are strange prisoners. Like ourselves; and they see only their own shadows or the shadows of one another, which the fire throws on the opposite wall of the cave.”*

—Plato  
*The Republic*

### Information about the Program

The film and media studies (FMS) program offers an interdepartmental concentration leading to a bachelor of arts degree. The FMS program offers students an opportunity to explore motion pictures, television, and digital media as art forms and cultural phenomena. The major and minor consist of specific courses offered by participating departments and provide opportunities for screening and analysis of centrally important films and videos in the history of cinema from the FMS Special Collection.

Many students go on to film or television school, pursuing graduate work in production, direction, screenwriting, cinematography, editing, acting and/or other creative aspects of media. Others choose to pursue graduate study of media history, theory, and criticism in master’s or doctoral programs. Media law and business also present exciting opportunities for postgraduate study. The major can also lead to careers in print and media journalism, arts and museum management, film preservation and curating, library science, and multimedia work.

The FMS program enjoys a close relationship with the George Eastman Museum. All University students have free access to the museum and library with a student ID. Important film screenings and special events are offered several nights a week at the Dryden and Curtis Theatres at a discounted cost to students. The remarkable archival resources of the museum are also available to students for course work and special projects.

### Departmental Advice for First-Year Students

Students should take one of the two introductory core courses—FMS 131 Introduction to Media Studies or FMS 132 Introduction to the Art of Film—before going on to more advanced or special-

ized courses in film history, criticism, theory, and production. Majors are advised to take a film history course, also, before developing their special interests in advanced courses. Courses in art history, photography, painting, music, literature, anthropology, and history provide strong support for various film courses, and these should be explored during a student’s first two years.

### Courses

The first two introductory courses listed below may lead into the film studies clusters. FMS 161 Introduction to Video Art is often a prerequisite for more advanced production courses in the major and priority registration is given sophomores and juniors who have officially declared an FMS major or minor.

**FMS 132/ENG 117 Introduction to the Art of Film.** This course presents the concepts of film form, aesthetics, and technique, while remaining attentive to the various ways in which cinema also involves an interaction with audiences and larger social structures. We closely examine the construction of a variety of film forms and styles—including the classic Hollywood style, new wave cinemas, experimental films, and contemporary independent and global cinemas. We also pay particular attention to the construction of film images, systems of film editing, film sound, and the various ways in which film systems can be organized (narrative, non-narrative, genres, etc.). (Fall)

**FMS 131/ENG 118 Introduction to Media Studies.** Discusses the cultural and economic history of visual media, with a focus on U.S. TV and questions of race, gender, and cultural identity. We cover histories of different types of media (telegraph, radio, audio recordings, television, film, Internet, etc.) as well as various theories and approaches to studying media. (Spring)

**FMS 161/SA 161 Introductory Video and Sound.** This course introduces the basic aesthetic and technical elements of video production. Emphasis is on the creative use and understanding of the video medium while learning to use the video camera, video editing processes, and the fundamental procedures of planning a video project. Video techniques are studied through screenings, group discussions, readings, practice sessions, and presentations of original video projects made during the course. (Fall and Spring)

**For more information, go to [sas.rochester.edu/fms](http://sas.rochester.edu/fms).**



## GENDER, SEXUALITY, AND WOMEN'S STUDIES



*"... it is the duty of all our schools, colleges, and universities to open their doors to woman and give her equal and identical education advantages side by side with her brother man."*

—Susan B. Anthony  
Motions for coeducation presented to  
state teachers' convention (1857)

### Information about the Program

The Susan B. Anthony Institute for Gender, Sexuality, and Women's Studies focuses on the changing cultural, economic, political, and psychological relations among people of all genders and sexualities. Because our discipline asks questions about gender and sexuality that no single academic department is able to answer, the program encourages an interdisciplinary approach to research and learning.

Our program includes faculty from the humanities, natural sciences, and social sciences who are appointed in the School of Arts & Sciences, Eastman School of Music, Warner School of Education, Simon Business School, School of Nursing, and School of Medicine and Dentistry.

#### Areas of faculty interest include

- history of sexuality
- women in history
- society, literature, art, and politics
- disability, gender, and sexuality
- queer theory
- race and ethnicity
- sexuality and psychology
- feminism in science, technology, and philosophy
- gender in literature, art, and media
- LGBTQIA+ studies

The institute sponsors faculty research seminars, conferences, mentorship events, and annual public lecture series. We offer

undergraduate majors, minors, and clusters in gender, sexuality, and women's studies in both the humanities and the social sciences.

Susan B. Anthony Institute research grants, graduate teaching fellowships, and graduate dissertation fellowships support the ongoing research and curricular development of our faculty and students.

#### Departmental Advice for First-Year Students

Students interested in pursuing a major in gender, sexuality, and women's studies (GSW) are encouraged to start with GSW 105 and other foundation courses (samples listed below) during their first and sophomore years, as well as GSW courses cross-listed with other departments

Two majors leading to the bachelor of arts degree are offered in GSW: one in the humanities and one in the social sciences. To complete a major, a student must take 10 courses (typically 40 credits) in GSW.

Two minors are offered in GSW: one in the humanities and one in the social sciences. To complete a minor, a student must take five GSW courses (typically 20 credits). Students may apply up to two courses taken abroad toward a GSW minor.

We offer two clusters in GSW; one in the humanities and one in the social sciences. To complete a cluster, a student must take three GSW courses (typically 12 credits).

Courses open to first-year students vary from year to year. Our introduction and foundation courses generally lead into clusters. Numerous elective courses cross-listed with women's studies are offered each year. Certain courses not already cross-listed with GSW can be taken through other departments and applied toward GSW credit. Students are advised to check with the institute office if they are interested in pursuing a cluster, minor, or major.

### Courses

#### Foundation Courses (Regularly Offered)

**GSW 100** topics change each semester. Fall 2019: **Working Women: From the Gendered Household to Labor Activism**; Spring 2020: **Televising Gender**

**GSW 105 Sex and Power.** This course is an introduction to the interdisciplinary scholarship of gender, sexuality, and women's studies and is team taught by Tanya Bakhmetyeva (lecturer of gender, sexuality, and women's studies) and Kristin Doughty (associate professor of anthropology and director of GSW). As a survey course, this class is designed to give students from diverse backgrounds and disciplines a basic understanding of debates and perspectives discussed in the field. We use gender as a critical lens to examine some of the social, cultural, economic, scientific, and political practices that organize our lives. We explore a multitude of feminist perspectives on the intersections of sex, gender, sexuality, race, ethnicity, class, religion, and other categories of identity. In this course, we interrogate these categories as socially constructed while acknowledging that these constructions have real effects in subordinating groups, marking bodies, and creating structural, intersectional inequalities.

**GSW 200 History of Feminism: Colloquium in GSW.** In this colloquium we look at the history of international feminism and explore its many faces. We examine the various factors that have contributed to women's historically lower status in society, look at

the emergence of women's rights and feminist movements as well as the distinctions among various feminist theories, and discuss the relevance of feminism today.

**GSW 206 Feminism, Gender, and Health.** This course considers how theories of gender, social organization, and biological sex shape the questions asked and explanations and interventions offered in the areas of health, disease, and well-being. We examine the effects of gender, social class, and race in mediating health effects, with particular emphasis on women's health. Some issues examined include life cycle and transitions, collective and individual trauma, access to health services, HIV/AIDS, reproductive health, and longevity.

**GSW 212 Queer Theory.** The goal of this course is to radically problematize the concepts of queer, gender, and sexuality, fundamentally questioning the assumptions that attend the usage and deployment of these terms in quotidian discourse. This is not your typical queer theory course, as we do not move from the center to the margins, relegating racialized bodies to the position of reactionary actors responding to an epistemic erasure. Rather, we center these critiques as the basis for a new canon and thus grounds for theory.

**GSW 213 Politics of Nature: Gender, Race, and the Environment.** This course explores the relationship between the environment and social inequality, focusing specifically on issues of gender, race, and class. Is there a connection between sexism, racism, class exploitation, and environmental destruction? Using intersectional feminist analysis, we investigate the historical roots of modern dualist constructions that juxtapose humans and the environment, men and women, creating an anthropocentric, racialized, and gendered framework that produces and maintains social inequalities and a destructive attitude toward the environment. Topics may include the following: historical ideas about nature and environment; eco-imperialism; eco-feminism; climate change and its connection to issues of race, gender, and class; justice and sustainability; poverty and natural resources; food justice; natural disasters (such as Hurricane Katrina) and their context; and others. The course features an optional three-day excursion to the Adirondack High Peaks Wilderness.

**GSW 215 LGBTQ+ Histories and Cultures in the U.S.** This course is a discussion-based learning experience that explores the history of lesbian, gay, bisexual, queer, transgender, and intersex (LGBTQI) history, communities, and identity through theory, pop culture, literature, and intersectional analysis. Topics include the emergence of subcultures and the organized activist movements from the 1920s through today, early sexuality theory and poststructuralist queer theory, and major historical events, including the AIDS epidemic and Stonewall Riots. Course is taught by KaeLyn Rich, assistant advocacy director (Chapters) of the New York Civil Liberties Union.

**Other GSW courses are offered each semester, as well. Please view the course description/course schedules database (CDCS) by term to explore further offerings, as there are many.**

**For more information, go to [sas.rochester.edu/gsw/](http://sas.rochester.edu/gsw/) or email [sbai@rochester.edu](mailto:sbai@rochester.edu).**

## GEOMECHANICS



*“Can one think that because we are engineers, beauty does not preoccupy us or that we do not try to build beautiful, as well as solid and long-lasting, structures? Aren't the genuine functions of strength always in keeping with unwritten conditions of harmony?”*

—Gustave Eiffel

### Information about the Program

A four-year geomechanics program is offered jointly with the Department of Earth and Environmental Sciences and the Department of Mechanical Engineering for students interested in the application of the field of mechanics to problems associated with the atmosphere; rivers, lakes, and oceans; and the solid earth. Students following this program should be well equipped for employment or graduate work in a variety of fields, including geophysics, hydrology, structural geology and rock mechanics, civil engineering, geotechnical engineering, oceanography, meteorology, environmental sciences, engineering geology, limnology, geothermal and petroleum exploration and production, and coastal and marine geology.

The geomechanics degree is awarded by the College in either the School of Arts & Sciences or in the Hajim School of Engineering & Applied Sciences—the choice is made by the student. If the student chooses the School of Arts & Sciences, his or her major advisor will be in the Department of Earth and Environmental Sciences; if the degree is to be granted through the Hajim School, the major advisor will be in the Department of Mechanical Engineering. In each case, the student will also have a minor advisor in the other department.

#### Advice for First-Year Students

The geomechanics curriculum is built around basic mathematics, physics, chemistry, earth and environmental sciences, and engineering courses. The required earth and environmental sciences courses cover geologic processes, the evolution of the earth, mineralogy, and structural geology. Required engineering courses deal with basic mechanics, thermodynamics, fluid mechanics, and solid mechanics. Technical electives, chosen from a number of earth and environmental sciences and engineering offerings, include courses in geophysics; fluid dynamics; advanced mechanics; heat transfer; rheology; rock mechanics; materials science; hydrology; sedimentary processes; and computational, field; and laboratory studies.



## Typical First-Year Program

### Fall Semester

MTH 161 (or MTH 141)  
Elective or WRT105  
EES 101  
CHM131

### Spring Semester

MTH 162 or (MTH 142)  
PHY 121  
CSC160  
WRT 105 or elective

For more information, go to [sas.rochester.edu/ees/](http://sas.rochester.edu/ees/) or [hajim.rochester.edu/me/](http://hajim.rochester.edu/me/).

## HISTORY



*“He to whom the present is the only thing that is present, knows nothing of the age in which he lives.”*

—Oscar Wilde

## Information about the Department

The Department of History is a dynamic community of teacher-scholars interested in studying the origins and formation of the complex, multicultural, and interconnected world in which we live. Our distinguished faculty shares a commitment to excellence in teaching and working closely with students to develop historical literacy, critical thinking, writing, and research skills. We use cutting-edge methods to connect the present with the past and to consider human experience across time and space. Because an understanding of the past is crucial to a wide array of political, economic, literary, artistic, anthropological, and humanistic studies, taking history courses can also benefit students majoring in these disciplines.

The department offers programs of study leading to the BA degree, the BA degree with honors, and (on the graduate level) master’s and doctorate degrees. We also offer a minor in history. Non-majors are welcome in almost all history courses and typically become enthusiastic, successful participants. The history concentration is valuable not only for those intent on becoming professional historians but also for those interested in pursuing careers in law, politics, public history, secondary school teaching, museum studies, historic preservation, and communications, among many other fields. The department also offers 15 clusters for non-majors to satisfy the social science divisional requirement in the Rochester Curriculum. These clusters consist of carefully selected sets of courses

and include both geographical (e.g., American History) and topical (e.g., History of Science, Technology, and Medicine) groupings. Students who wish to substitute a course in a cluster can consult the department’s director of undergraduate studies, Professor Pablo Sierra ([pablo.sierra@rochester.edu](mailto:pablo.sierra@rochester.edu)).

The department offers a wide range of undergraduate courses encompassing social, economic, cultural, intellectual, political, and digital approaches to historical problems and periods. Most 100- and 200-level courses in the department are accessible to students with little background knowledge in history. In addition, the faculty offers 300-level seminars and courses designed for majors and students interested in exploring more specialized historical topics (200-level courses designated with a “W” and all 300W courses meet the college’s upper-level writing requirement). Each student concentrating in history will have a faculty advisor. The choice of that advisor will ideally match a student’s particular historical interests and will be made in consultation with the director of undergraduate studies. This advisor will help prospective majors plan their programs. In addition, advisors serve as a resource for selecting courses, making changes to a major program, alerting students to special opportunities in the major (research opportunities, honors, internships, etc.), and offering advice on further study and work after graduation. The first step in declaring a history major is to consult with a faculty advisor. For the most current information about the history department and the faculty as well as requirements for a history major or minor, please visit our website, [www.sas.rochester.edu/his/](http://www.sas.rochester.edu/his/). You can also follow us on Facebook @UofRHistory Department or on Twitter @urhistorydept.

### Advice to First-Year Students

The department recommends that incoming first-year students enroll in one or more of the 100-level or 200-level regional or topical courses prior to taking HIS 200, Gateway to History. History 200 introduces students to the practice of history. Each section focuses on a specific topic offered by a professor specializing in this subject (for example, the Eastern Front in World War II or pirates of the Caribbean). The registrar’s course schedule (CDCS) lists the topic for each section. History majors are encouraged to complete History 200 in their first or second year, so prospective majors should consider taking this class early. However, History 200 is not a prerequisite for other 100- or 200-level history courses. Most of our introductory courses provide an excellent entry into a number of departmental clusters as well (see course list and applicable clusters below).

As a discipline, history covers different cultures, multiple eras, and various approaches to a wide array of subjects. Consequently, history majors are required to take a diverse selection of courses covering time periods before and after 1800 and at least three different geographical areas of the world. Introductory courses meet this distribution requirement, as do more advanced courses. Majors also choose a five-course focus area.

Students who choose to double-major in history and another discipline or program in the humanities or the social sciences may, with the permission of the director of undergraduate studies, use one or two courses from the other major toward the fulfillment of the history major; double majors must, however, meet the geographical and chronological distribution requirements and the upper-level writing requirement with history courses.



Students with doubts about whether a given course is right for them are urged to discuss their selections with the course's instructor or their academic advisor. The director of undergraduate studies also welcomes visits from prospective students during office hours or by appointment. Other faculty are also available during their on-call advising hours.

Majors can pursue summer or semester-long public history internships (HIS 394) at a variety of local and regional museums, historic sites, archives, municipal agencies, and the Department of Rare Books and Special Collections in Rush Rhees Library. These internships provide valuable "hands-on" experience in a wide range of history-related careers.

First-year students interested in history are also encouraged to join the Undergraduate History Council, which provides information about the department, sponsors lectures, and holds social events.

### Advanced Placement (AP)

Advanced placement credit will be granted for scores of 5 on the American History, European History, or World History exam. This credit is elective credit and may not be used to satisfy the geographical or chronological distribution requirements in the major or minor or to satisfy the focus requirement in the major.

### International Baccalaureate (IB)

International Baccalaureate credit will be granted in cases where students score 6 or better on their higher-level exam. No credit is granted for subsidiary-level exams. This credit is elective and may not be used to satisfy the geographical, chronological, or focus requirements of the major.

No more than four courses in the major and no more than two courses in the minor may come from courses taken elsewhere, study abroad courses, AP credit, IB credit, or cross-listed courses taught by faculty not formally associated with the Department of History. A student may receive no more than a combined total of 4 elective credits (the equivalent of one course) for AP and IB exams.

### Clusters

Most courses offered by the history department can be used toward a social sciences cluster in history, and many can be used for clusters outside of the department. A listing of the history department's clusters is available at the department office in Room 364, Rush Rhees Library, or it can be viewed through the online cluster list/search engine at <https://secure1.rochester.edu/registrar/CSE/>.

## Courses

### Fall Semester

#### *Introductory Courses*

**HIS 127 Foundations of Medieval France.** This course provides an introduction to the study of history through an investigation of "the long 12th century" in France.

**HIS 128 Postwar Europe.** This course examines Europe since Zero Hour 1945 as a singular space—one struggling with the past and reimagining its future.

**HIS 133 Russian Revolutions from Lenin to Putin.** Using original documents, novels, and films, we probe the history of the Communist revolution of 1917, Stalinist society, the central Soviet role in World War II, and the Cold War.

**HIS 145 Modern Japan.** This course covers Japanese history from the 1800s to the present. Come join us in this journey of books, archives, films, and anime in search of modern Japan.

**HIS 149 Writing Latino America.** We analyze a variety of strategies through which recent historians have interpreted the relationship of Latinos to American society.

**HIS 150 Colonial Latin America.** This course focuses on the Spanish and Portuguese conquests and colonization of the region that we now know as Latin America.

**HIS 156 A Communist Country on America's Doorstep: Cuba from Columbus to the Present.** This course examines the evolution of socioeconomic and political interest groups in colonial Spanish Cuba, the subsequent American entanglement in the internal historical processes in Cuba, and the ultimate involvement of the Soviet Union.

**HIS 166 Liberal America, 1929–1973.** This course is an examination of the development of American politics, society, and culture between the Great Depression and the Watergate scandal.

**HIS 167M Thoreau's Nature.** (*Meliora Seminar*) In this interdisciplinary seminar, students engage with three of Henry David Thoreau's major works and with the man himself.

**HIS 170 Intro to African-American History.** We produce a brief history of the ways in which African Americans adapted to and shaped American life and society.

**HIS 174 American Military History.** This course surveys the history of American wars.

**HIS 196 Crusade, Jihad, and the Medieval Mediterranean World.** This course addresses the full range of political, social, and religious issues involved in the Crusades.

**HIS 197 History of Espionage.** This class confronts the political, cultural, and social implications of espionage in world history.

**HIS 200 Gateway to History: Homosexuals, Heretics, Witches and Werewolves: Deviants in Medieval Society.** This course focuses upon the concept of deviance in medieval Europe.

**HIS 200 Gateway to History: Mexico through Time.** This course opens a fascinating window into the techniques, methods, and sources that historians of Mexico use to understand the past.

**HIS 209 Corruption and the Global Economy in Historical Perspective.** We research and discuss widespread corruption in the global economy and the processes that explain it.

**HIS 211W Guns, War, and Revolution in Southern Africa.** We explore the ways in which southern Africa's fifteen states freed themselves from European colonialism.

**HIS 222W The Cultural History of 20th-Century Mexico.** This course considers Mexico's rich and vibrant cultural history beginning with the Mexican Revolution (1910–20).

**HIS 225W Europe and the Great War.** This course is an introduction to the history of Europe during the First World War.

**HIS 227W Podcasting History: *Hear UR*.** Students research, develop, and produce episodes of *Hear UR*, a podcast series about the environmental history of Rochester.

**HIS 231W Topics in Early Modern Europe.** This course explores a special topic in early modern European history.

**HIS 241W Digital History: The South China Sea.** This course traces the history of trade, piracy, cultural diffusion, imperialism, and decolonization in and around the South China Sea.

**HIS 244W China in Africa: The Socialist and Capitalist Stories.** This course traces China's involvement in Africa from the 1940s to the present.

**HIS 245W Tibet: History from Myth.** We study the history of Tibet and the roles of neighbors like China and India in shaping that history.

**HIS 267W History of White Supremacy.** This course examines the competing forces that produced a white supremacy ideology that was unique to the United States.

**HIS 277B American Movies in their Moment: The Golden Age, 1929–1946.** This course considers feature films as evidence for the cultural history of modern America.

**For more information, go to [sas.rochester.edu/his/](https://sas.rochester.edu/his/).**

## JEWISH STUDIES



*“Courage is a special kind of knowledge: the knowledge of how to fear what ought to be feared and how not to fear what ought not to be feared.”*

—David Ben-Gurion

### Information about the Program

The undergraduate Jewish studies program at University of Rochester is designed to enable students to become familiar with the history, religion, philosophy, literatures, languages, and politics of Judaism. As Jewish civilization developed across a variety of geographical and cultural areas of the world and over thousands of years, the program's course offerings reflect the complex, many-faceted, and heterogeneous dimensions of the Jewish experience with classes on the Hebrew Bible; ancient, medieval, and modern Jewish history; the Holocaust; Gender Studies; American Judaism; modern Jewish literatures; and classical and Modern Hebrew. As an interdisciplinary program, Jewish studies brings together faculty from different departments whose interests are diverse and cross-cultural and favor a variety of approaches to the study of Jewish life and culture. Students of all backgrounds are welcome to take Jewish studies courses and participate in the program.

The undergraduate program in Jewish studies is housed in the Department of Religion and Classics and is an integral part of the Center for Jewish Studies at the University of Rochester, which promotes research, scholarship, and education in Judaism and Judaica.

Currently, the program offers a minor in Jewish studies and a minor in Hebrew. There are three clusters: one in Jewish studies, one in Judaism, and one in Hebrew language and literature. Additionally, courses in Jewish studies count toward a variety of clusters in other programs, such as modern languages and cultures, history, and international relations.

#### Hebrew Language Instruction

The Hebrew program at Rochester consists of four sequential semester-long courses in Modern Hebrew from beginner through lower-intermediate level and one advanced class focusing on the language of media and literature. One semester-long introductory class in Biblical Hebrew is also offered.

HEB 101, Elementary Modern Hebrew, is tailored for students with no background in Hebrew or with previous unsystematic exposure to the language. Students with previous substantial knowledge of Hebrew are requested to take a placement test before enrolling in a course. This will ensure they are placed at the correct level of instruction.

### Departmental Advice for First-Year Students

First-year students are encouraged to begin with a 100-level course in Jewish studies, such as REL 101, Introduction to the Hebrew Bible/Old Testament, or REL 113, History of Judaism.

For information about the program or orientation to minors, clusters, and Hebrew language instruction courses, students are encouraged to contact the Jewish studies program coordinator, Dr. Michela Andreatta, in Rush Rhees Library, room 420 or by email at [michelaandreatta@rochester.edu](mailto:michelaandreatta@rochester.edu).

## Courses

### Fall Semester

#### *Judaism*

**JST 106 Introduction to the Old Testament.** This class examines the texts of the Hebrew Bible (Old Testament for Christians) in their religious, historical, and literary contexts. In this course, students learn the history of the Ancient Israelite people from their origins down through the post-Exilic period. Study of the texts of the Hebrew Bible (Old Testament) enable us to explore what we can know about ancient Israelite society and culture, the rise and fall of Israel as a nation-state, religious and theological debates about the role of God in shaping history and the problem of suffering, as well as the writing of the biblical texts and the development of the canon.

**JST 121 Women in Judaism.** This course examines approaches to the body and gender as described and manifested in Jewish texts, rituals, and communal practice from the biblical period to the present. We look at interpretations of the body and its effect on the status of women in particular in the Bible and Talmud, paying close attention to the historical and cultural contexts of these interpretations. There is a strong focus on modern reevaluations of gender and the body and how such reevaluations have transformed what it means to be “Jewish.” Topics include rites of passage, images of women in the Bible, and feminist theology as well as theories and depictions of the “Jewish body.”

**JST 214 Imagining the Jew.** This seminar examines the representation of Orthodox Jews by American Jews on both page and screen. This course should equip you to understand—historically and critically—the core factors in this contemporary culture war, such as gender, religious authority, and political affiliation as well as to empathetically appreciate current concern over acculturation, Americanization, and Jewish continuity.

### *Hebrew*

**HEB/JST 101 Elementary Modern Hebrew I.** Introduction to the basic structures of standard Modern Hebrew. This class is intended for students with no previous instruction in the language or for those who have had some unsystematic exposure to it. Practice

in reading, writing, basic use, and grammar. In addition to texts, relevant cultural materials are provided through the use of audio, video, and technology-based materials.

**HEB/JST 103 Intermediate Modern Hebrew I.** Direct continuation of Hebrew 102 with emphasis on enhancing reading comprehension and writing and speaking skills in standard Modern Hebrew. Students enrolling are expected to have a good understanding of basic Hebrew grammar structures, including familiarity with common verb forms. In addition to texts, relevant cultural materials are provided through the use of audio, video, and technology-based materials.

### Spring Semester

#### *Judaism*

**JST 113 History of Judaism.** This class provides an introduction to the religious and cultural development of Judaism. It emphasizes Judaism as a living tradition, one that has been subject to both continuity and change among its practitioners throughout its history.

**JST 184 Judaism and Film.** In this course students examine the portrayal of Judaism and the various interpretations and iterations of Jewish identity through American, European, and Israeli film, both contemporary and classic. The course addresses issues such as immigration and assimilation, gender and the status of women, religious reform, and responses to Holocaust, with close attention to the significant impact and influence of American representations of Jewish life. Select readings sharpen our analysis of film as well as situate the films within the historical and cultural contexts in which they were produced.

**JST 266 Jews and Muslims.**

**JST 276 Jews and Food.**

### *Hebrew*

**HEB/JST 102 Elementary Modern Hebrew II.** Direct continuation of Hebrew 101 with emphasis on enhancing basic reading, writing, and speaking skills in standard Modern Hebrew. In addition to reading texts, relevant cultural materials are provided through the use of audio, video, and technology-based materials.

**HEB/JST 104 Intermediate Modern Hebrew II.** This is a fourth semester course in the Hebrew language series designed as a direct continuation of HEB 103. The focus of instruction is on the enhancement of language skills through the acquisition of complex morphological and syntactical structures and the expansion of vocabulary and idioms. The course has an emphasis on oral and written communication in both standard and colloquial Modern Hebrew. In addition to reading texts, relevant cultural materials are provided through the use of audio, video, and technology-based materials.

**HEB/JST 110 Introduction to Biblical Hebrew.** A one-semester introduction to classical Hebrew for beginners. The course covers the Hebrew writing system (alphabet and pointing/vocalization rules) and basic grammatical structures and vocabulary, and includes the guided reading of selected biblical narratives in the original.

**For more information, go to [sas.rochester.edu/jst/](http://sas.rochester.edu/jst/).**



## LATIN AMERICAN STUDIES (MODERN LANGUAGES AND CULTURES)



### Information about the Program

The minor in Latin American studies gives students a broad view of Latin American cultures and their relations to the United States and the rest of the world.

A total of five courses related to Latin American people, their languages, and their cultures are required for the minor; roughly half of the course content must feature content relating to Latin America. Two courses must be from two different academic areas such as anthropology, business, economics, history, international relations, political science, Portuguese, religion, or Spanish. Students are permitted to use up to two study abroad courses with approval of one of the program advisors (please refer to website).

Students interested in the Latin American studies minor are strongly encouraged to work with one of the Latin American program advisors (please refer to website).

Students wishing to satisfy the humanities or social sciences division requirement must take three of the five classes from that division.

#### Program Advice for First-Year Students

Students interested in pursuing the Latin American studies minor are encouraged to work closely with a program advisor (please refer to the website) in developing their plan of study. A language prerequisite must be successfully completed before students are eligible to declare a Latin American studies minor. Students must complete either SP 151 and SP 152 (Intermediate Spanish I and II) or POR 151 and POR 152 (Intermediate Portuguese I and II). Students who are placed in SP 200, Advanced Spanish Composition, may use this course as their language prerequisite.

**For more information, go to [sas.rochester.edu/mlc/undergraduate/spanish.html#lasminor](http://sas.rochester.edu/mlc/undergraduate/spanish.html#lasminor).**

## LEGAL STUDIES (MULTIDISCIPLINARY STUDIES CENTER)



### Information about the Program

The legal studies program offers both a minor and two clusters. The minor in legal studies is an interdisciplinary program of study that gives students the opportunity to examine law from a variety of perspectives. The study of law is a humanistic enterprise and, while the minor should be useful for those who may be thinking of attending law school, it should not be considered a program in preprofessional training.

The goals of the minor are to educate students in certain broadly relevant analytical skills, to introduce students to what it means to study a social phenomenon from a variety of perspectives, to help students obtain a better understanding of law and the multiple functions it plays in a variety of societies, to encourage writing and the development of writing skills, and to stimulate greater interaction among faculty interested in law and society.

#### Program Advice for First-Year Students

Since many of the courses in the program are upper-level courses in the departments involved, first-year students who are interested in the minor may wish to begin by taking appropriate introductory courses in some of the relevant departments. Most legal studies minors do not declare the minor until their sophomore or junior year. Students of any year who are interested in the legal studies minor are encouraged to consult a legal studies minor advisor.

#### Clusters

There are two clusters in legal studies, one in the humanities division and one in the social sciences division.

### Courses

**ENG 135 Introduction to Debate.** (*Humanities*) The purpose of this course is to give students an appreciation for and knowledge of critical thinking and reasoned decision making through argumentation. Students research both sides of a topic, write argument briefs, and participate in formal and informal debates. Students are also exposed to the major paradigms used in judging debates. (Spring)

**HIS 166 Liberal America, 1929–1973.** (*Social Sciences*) This course is an examination of the development of American politics, society, and culture between the onset of the Great Depression and the Watergate scandal. It focuses on the creation and consolidation of the New Deal—a liberal political economy centered on a constrained corporate capitalism, a modest welfare state, and a national security apparatus designed to wage the Cold War and extend American power abroad. (Fall)

**PHL 103 Moral Problems.** (*Humanities*) An introduction to moral philosophy as applied to current topics. Reasoned analysis of controversies concerning such matters as the death penalty, abortion, individual rights, sexual harassment and discrimination, global justice, terrorism and civil liberties, animal rights, and the environment. (Fall and Spring)

**PHL 105 Reason and Argument.** (*Humanities*) Methods of identifying, interpreting, reconstructing, and evaluating reasoning found in speeches, essays, editorials, magazine articles, and scientific reports. Analytical methods mastered in this course do not include those of formal symbolic logic. (Fall)

**PHL 110 Introductory Logic.** Logic is the study of valid forms of argument. This course is an introduction to symbolic logic, a modern theory of logic that involves the construction of an artificial symbolic language within which the logical forms of sentences can be expressed and the validity of arguments can be proven. Students learn two logical systems: sentence logic and predicate logic. In addition to translating English arguments into symbolic form and constructing interpretations to demonstrate the invalidity of arguments, students also learn how to prove that an argument is valid using a set of rigorously defined implication rules for each logical system. (Fall)

**PSC 107 Introduction to Positive Political Theory.** (*Social Sciences*) This course introduces students to positive political theory, a rigorous set of tools that helps clarify key questions in political science. Through examples drawn from all aspects of the political process (from elections to lawmaking to regulation) as well as from everyday life (where should we go for dinner?) and Hollywood (Russell Crowe and Reese Witherspoon as political scientists?), we study how the rules of the game affect the decisions politicians make as well as the policy outcomes we observe. (Fall)

### Spring Semester

For information on spring course offerings, please visit the legal studies website.

**For more information, go to [sas.rochester.edu/lin/](http://sas.rochester.edu/lin/).**

## LINGUISTICS



*“The job of the linguist, like that of the biologist or the botanist, is not to tell us how nature should behave, or what its creations should look like, but to describe those creations in all their messy glory and try to figure out what they can teach us about life, the world, and, especially in the case of linguistics, the workings of the human mind.”*

—Arika Okrent

### Information about the Department

Contemporary linguistics is the study of the structure of human language. The Department of Linguistics offers courses in the core areas of linguistics: phonetics, phonology, syntax, semantics and pragmatics, and computational linguistics. We also offer 100-level courses that focus on language in culture and society. Linguistics gives students experience in analyzing complex data, a skill useful in a variety of careers. Our graduates enter fields such as teaching, law, linguistics, speech pathology, and research, among many others.

### Departmental Advice for First-Year Students

The 200-level courses are the courses for majors and minors; LIN 110 Intro to Linguistic Analysis is a prerequisite course for the major. First-year students with a strong interest in linguistics are advised to take LIN 110.

The other 100-level courses address contemporary issues with a perspective on language and society that is informed by contemporary linguistics. The 100-level courses are suitable for first-year students. Please check the course listings in the undergraduate section of the department website. Students with an interest in linguistics are encouraged to take courses in one or more languages in addition to their linguistics courses.

Clusters in linguistics satisfy the cluster requirements for social sciences.

## Courses

### Every Term

**LIN 110 Introduction to Linguistic Analysis.** This course introduces students to the study of the structure of human language. We cover the six core areas of linguistics focusing on developing skills in linguistic analysis. In addition to the lecture, students need to regis-

ter for a peer-led workshop. Part of clusters S1LIN001, S1LIN002, S1LIN004, S1LIN005, and S1LIN007. (Fall and Spring) Please note: Students who take LIN 110 in the fall may be eligible to take 200-level courses in the spring.

#### Fall Semester

**LIN 102 Language and Social Identity.** This course introduces how language is used and perceived to mark social and cultural characteristics of an individual or group of individuals. We examine how one's social identity is constructed, which linguistic cues are used consciously to denote different social identities, and how most linguistic cues delineating social groupings are below conscious awareness. This course discusses topics on prescriptive and descriptive perspectives of language, standardization, dialects, accents, pidgins and creoles, social stratification, and linguistic profiling.

**LIN 104 Language and Culture.** This course investigates the relationship between language and culture at the interface of linguistics and culture. Topics may include kinship systems and language; language of perception (e.g., colors, spatial relations); culture and language change/language variation; writing systems and intercultural communication; and how language reflects the perceptions of the world, ways of life, and beliefs of its speakers. Part of cluster S1LIN006.

#### Spring Semester

**LIN 162 Modern African-American English.** This course looks at the varieties of English used primarily by and among African Americans. We first explore and discuss the linguistic features (lexicon and grammar) of African American Vernacular English (AAVE)—also called African American English. We also investigate the ways in which AAVE is being utilized in popular culture. Additionally, we look at AAVE's connection to African languages and creoles. Finally, this course looks at the issues connected to AAVE and attitudes toward this variety and its effects on teachers' expectations and students' progress as well as on linguistic profiling and discrimination in employment and housing. Part of cluster S1LIN006.

**LIN 220 Introduction to Grammatical Systems.** This introductory course examines the grammatical structure of sentences from the standpoint of transformational grammar. The course develops the basic techniques of syntactic analysis in order to develop a working grammar of (a fragment of) English. No syntax background is assumed. This course is intended for majors and nonmajors alike. In addition to the lecture, students need to register for a peer-led workshop. Prerequisite: LIN 110 (Fall). Part of clusters S1LIN002, S1LIN004, S1LIN007, and S1MAS001.

**LIN 224 Introduction to Computational Linguistics.** This course covers foundational concepts in computational linguistics and is designed for students with a strong background in formal linguistic methods but little or no programming experience. Major focus is placed on deploying techniques used in computational linguistics to advance linguistic theory as well as developing students' ability to implement these techniques. Topics include basic object-oriented programming in Python, basic formal language theory, probability theory and information theory, finite state phonological and morphological analysis, generative and discriminative models for shallow syntactic and semantic parsing, and bottom-up,

top-down and mixed algorithms for syntactic and semantic parsing. Prerequisite: LIN 110 (Fall).

**LIN 240 Topics in Language Variation and Change.** This course offers an overview of the role of language in society. We examine the way spoken language varies according to the social characteristics of its speakers, focusing on age, sex, ethnicity, style, social status, and geography. We also explore topics such as politeness theory and language planning and policy. Methods for quantitative analysis of linguistic variation are introduced. Prerequisites: LIN 110 (Fall). LIN 210 or 220 recommended but not required.

For more information, go to [sas.rochester.edu/lin/](http://sas.rochester.edu/lin/).

## MATHEMATICS



*The universe is a grand book which cannot be read until one first learns to comprehend the language and become familiar with the characters in which it is composed. That language is mathematics."*

—Galileo Galilei

## Information about the Department

The Department of Mathematics has several introductory sequences to suit students' interests and goals. The sequence MTH 161–162 is the standard introductory calculus sequence for students who intend to major in mathematics, a physical science, engineering, or another technical field. The sequence MTH 141–143 covers the same material as MTH 161–162 but at a slower pace (in three semesters rather than two), using the same textbook. Students lacking the algebra or trigonometry background necessary to perform successfully in MTH 141 should take MTH 140, Foundations of Calculus. The department also offers the honors calculus sequence MTH 171–174 for talented students interested in mathematics or its theoretical applications to other fields. See below for more information on these sequences and AP credit rules.

One of the primary factors conducive to success in mathematics is placement in the appropriate course. The Department of Mathematics uses a combination of SAT and ACT scores, AP calculus exam scores, and high school records to place students. Advanced Placement credit rules take precedence over SATs and ACTs.



For students placed in either MTH 140 or MTH 141 who wish to enroll in a higher course, there will be a placement test offered at the beginning of the semester. See the placement web page [www.sas.rochester.edu/mth/undergraduate/handbook/placement.html](http://www.sas.rochester.edu/mth/undergraduate/handbook/placement.html) for more information regarding placement guidelines. In case of discrepancy or questions, students are encouraged to speak with a representative of the mathematics department at the Academic Open House during Orientation

### Advanced Placement (AP)

The Department of Mathematics gives credit and placement to students who have taken the CEEB Advanced Placement examinations in Mathematics (Calculus AB and Calculus BC) as follows:

*Note: taking more than one MTH course per semester in the first year is usually discouraged. Students wishing to do so should discuss their plans with a departmental representative.*

#### AP Calculus, AB exam:

**Score of 4 or 5**—Student will be placed in MTH 162 or 171 (after consultation with a mathematics faculty member) with one semester advanced placement (MTH 161, 4 credits) granted.

#### AP Calculus, BC exam:

**Score of 3**—Student will be placed in MTH 162 or 171 (after consultation with a mathematics faculty member) with one semester advanced placement (MTH 161, 4 credits) granted.

**Score of 4 or 5**—Student will be granted two semesters of advanced placement (8 credits) for MTH 161 and MTH 162, and placed in MTH 164 or 165. Students interested in gaining a deeper understanding of mathematics are encouraged to register instead for MTH 171 and receive 4 credits of advanced placement. In rare instances of exceptional preparation, students may register for MTH 173 in consultation with the instructor of that course and receive 8 credits of advanced placement for MTH 161 and MTH 162.

Students who receive AP credit for MTH 161 may register for MTH 162 or 171. MTH 171 is particularly recommended for students interested in mathematics, physics, computer science, or theoretical engineering who would like to gain a deeper knowledge of how and why calculus works so effectively.

There is no advanced placement in the 140 sequence.

*Note: An “AB subscore” is reported along with the BC score. Placement and credit should be the more generous of the two resulting from using both the AB subscore and the BC score in the guidelines above. However, if the difference between the AB subscore and the BC score is greater than or equal to two, the student should be referred to the mathematics table for further guidance.*

### International Baccalaureate (IB)

Mathematics—Students who score a 4 or better on a higher-level exam are placed into MTH 162 and awarded credit for MTH 161 after completion of MTH 162 with a grade of C or better. No credit is granted for subsidiary-level exams.

### Clusters

All of the following courses belong to various clusters in mathematics. MTH 141 and 161 are also part of many clusters in the natural sciences.

## Courses

Traditionally, the different sections of the standard calculus sequences, MTH 141–143 and MTH 161–162, are coordinated with each other. They cover the same material, assign the same homework, have common exams, and are graded on a common scale.

**MTH 130 Excursions in Mathematics.** The nature of mathematics and its application are discussed. Emphasis is on concepts and understanding rather than techniques. This course is intended mainly for concentrators in the humanities. (Spring)

**MTH 140 Foundations of Calculus.** This course covers precalculus material and is intended for students lacking the algebra and trigonometry background necessary to perform successfully in MTH 141. After completing this course, students are ready to take MTH 141. MTH 140 is offered in the fall only and is open to all incoming first-year students.

**MTH 141–143 Calculus I, II, III.** This sequence covers the same material as MTH 161–162 (see below) but in three semesters rather than two, using the same textbook. MTH 143 is an adequate prerequisite for MTH 164 and 165. Courses 141–143 must be taken in sequence and are offered every fall and spring. MTH 141 is open to all first-year students placed in MTH 141 or a higher-numbered course.

**MTH 150 Discrete Mathematics.** Logic, functions, algorithms, mathematical reasoning, mathematical induction, recurrence relations, techniques of counting, equivalence relations, graphs, trees, as well as specific questions given by the “Towers of Hanoi” and Euler’s “Seven Bridges of Königsberg” problems. Required for computer science majors. Open to all first-year students. (Fall and Spring).

**MTH 150A Discrete Mathematics Module.** *This module course is only available to students who are taking MTH 171 or MTH 173 and yields only 1 credit.* Students do the exams in the regular MTH 150 course and *may* attend lectures if they wish. This module is primarily for computer science majors who need MTH 150 credit for their Spring Semester computer science courses but have no room in their schedule for the regular 4-credit course.

**MTH 161–162 Calculus IA, IIA.** The sequence 161, 162, is the standard introductory calculus sequence for students who intend to major in mathematics, a physical science, engineering, or another technical field. Emphasis is on learning applications and techniques. Courses 161–162 must be taken in sequence. (Fall and Spring) MTH 161 is open to all first-year students placed in MTH 161 or a higher-numbered course; MTH 162 is open to first-year students with advanced placement credit.

**MTH 164 Multidimensional Calculus.** This extends the calculus techniques to handle functions of more than one variable. It also concentrates increasingly on the geometric aspect of calculus, which is particularly important for applying calculus to problems in physical sciences and engineering. This course is open to first-year students with two semesters of advanced placement credit. Prerequisite: MTH 162. (Fall and Spring)

**MTH 165 Linear Algebra with Differential Equations.** This course provides an introduction to the basic concepts of linear algebra and ordinary differential equations. It spends about two thirds of the semester covering linear algebra up through eigenvalues

and eigenvectors and one third of the semester covering elementary methods involved in solving linear differential equations and systems with constant coefficients. This course is open to first-year students with two semesters of advanced placement credit. Prerequisite: MTH 162. (Fall and Spring)

**MTH 171–174 Honors Calculus I; II; III; IV.** This sequence is an honors calculus sequence for talented students interested in mathematics or its theoretical applications to other fields. The sequence emphasizes the theoretical understanding of calculus in addition to teaching technical skills. Students completing the sequence will have acquired a deep understanding of the subject. The sequence satisfies all the basic mathematical prerequisites for majors and minors in mathematics, physics, and engineering. These include single variable calculus (MTH 161–162), multivariable calculus (MTH 164), differential equations, and linear algebra (MTH 165, 235). Each semester of the sequence is granted 5 credit hours rather than 4. Courses MTH 171–174 must be taken in sequence. MTH 171 is offered every fall. Students interested in taking MTH 171 should discuss their plans with a departmental representative from mathematics.

**MTH 190 Topics in Problem Solving.** This course is intended for students interested in developing problem-solving skills in mathematics. This course also prepares students for college-level mathematical competitions such as the Putnam.

**For more information, go to [sas.rochester.edu/mth/](http://sas.rochester.edu/mth/).**

## MECHANICAL ENGINEERING



*“I believe, of course, in giving to all the people a good education. But the education must contain much besides book-learning in order to be really good”*

—Theodore Roosevelt  
 (“Citizenship in a Republic,” April 23, 1910)

### Information about the Department

The mechanical engineering curriculum provides a balance of courses in the humanities and social sciences, physics, applied mathematics, and engineering principles and design. Since modern engineering is increasingly reliant on computers for things such as computation, data storage and retrieval, visualization of complex engineering problems, laboratory instrumentation, and presentation of project results, we have included computer work throughout the curriculum. Emphasis is placed on the underlying fundamentals in the required engineering coursework, enabling graduates to adapt throughout their careers to rapid advances in science and technology. Training in the design process is increasingly emphasized in the later years of the program. The capstone senior design sequence often features real design problems drawn from local industry. Design examples include wind turbines for third-world installation, automotive fuel valves, large optomechanical mirrors for solar power, automotive frames and suspensions, 3D printing of optics, heat transfer in organic farms, sustainable industrial refrigeration, and injection molding machines.

The overall educational objective of our program is to develop effective practitioners in mechanical engineering and associated fields. Our graduates will confidently apply knowledge in the basic sciences, mathematics, engineering analysis, computation, experimentation, and design to address emerging and evolving engineering challenges. They will contribute to the advancement of their chosen field while remaining mindful of the ethical, safety, and social implications of their work. They will be able to communicate effectively and work in multidisciplinary teams and will be well equipped for leadership roles in industry, academia, and government.

In keeping with the continuously evolving nature of mechanical engineering, we expect that our alumni will engage actively in lifelong learning and professional development activities, and that many of them, inspired by research experiences as undergraduates, will continue their education in advanced degree programs.

### Departmental Advice for First-Year Students

Mechanical engineering requires a solid foundation in mathematics, physics, and chemistry. This is built during the first two years of the program while students also take a first set of core mechanical engineering courses. In the second two years of the program, students take an increased number of mechanical engineering specialty courses, including many with an open-ended design component. To provide the breadth of knowledge required to address modern engineering questions, this science and engineering focus is also balanced in the curriculum by a selection of humanities and social science courses.

Many undergraduates in the department assist faculty members in research projects during the academic year and the summer. Recent projects involving undergraduates include experiments in controlled nuclear fusion using high-power lasers, fuel cells, engineering coolants and lubricants, micro fluids, MicroElectro–Mechanical Systems (MEMS) and Micro–Optical Electro–Mechanical Systems (MOEMS), precision engineering and instrumentation, precision grinding tools, CNC machining, optical manufacturing, shape memory polymers, experimental observation of collective phenomena in fluids, edge strength testing of screens for smart devices, structural mechanics of historical structures, bubble dynamics, and the design of an automatic transmission for a bicycle.

Many of our students interact with local companies like Harris, Xerox, Wegmans, General Motors, Bausch and Lomb, OptiPro, and Gleason Works. This often occurs through company sponsorship of a project in one of the design or laboratory courses. Our “Industry Practicum” program provides part-time work during the academic year and full-time employment during the summer for selected students. Major University facilities such as the Laboratory for Laser Energetics and Strong Memorial Hospital are also sources for design and internship opportunities.

We encourage our students to study abroad, typically for one semester in the junior year. Study abroad credits transfer to the undergraduate major in mechanical engineering, and instruction can be in English. Examples of study abroad sites, among many others, are Australia, Spain, England, Botswana, New Zealand, and Israel.

### Typical First-Year Program

#### Fall Semester

MTH 141 or MTH 161  
CHM 137  
Technical elective  
(EAS 10X recommended)  
WRT 105 or elective

#### Spring Semester

MTH 142 or MTH 162  
PHY 121  
ME 120  
WRT 105 or elective

## Courses

*(Mechanical engineering courses available to first-year students)*

**EAS 104/ME 104 The Engineering of Bridges.** An introduction to the art of bridge building based on the study of the engineering and technological problems involved in the design, construction, and collapse of bridges from antiquity to the present time. The course includes several case studies of major historical bridges selected for their structural significance. Students learn how to calculate the forces acting on structural elements, how these forces depend on the bridge structural form, how the form itself is conditioned by the structural materials, and how forces are measured with

electromechanical instrumentation. The study includes fundamental notions of mechanics, strength of materials, structural behavior, instrumentation failure analysis, and design optimization. Working in teams, students use constructive experimental models as well as computer-aided programs to design, build, instrument, and test realistic bridge projects. This is a self-contained course open to all Rochester undergraduates. (Fall)

**ME 110 Introduction to Computer Aided Design and Drawing.** The course is designed to give first-year students interested in technology an introduction to reading and creating engineering drawings on a state-of-the-art computer-aided design system. The students also get exposure to manufacturing techniques, including a tour of a manufacturing facility. The course may be used for clusters in Design with Materials and Engineering Design. (Fall and Spring) (2 credits)

**ME 120 Engineering Mechanics I Statics.** This course covers the concepts of force and moment and their transmission in engineering structures such as trusses, frames, machines, and beams. Examples and applications range from machines to biomechanical structures. The course may be used for clusters in Biomedical Engineering, Engineering Design, Force and Motion, General Science, Mechanics, and Modern Technology. (Fall and Spring)

**ME 106 Engineering in Antiquity.** The application of engineering principles and technology to the design and performance of engineering structures from antiquity to the preindustrial world. The course combines literary, archaeological, and engineering evidence. We apply basic engineering principles (transfer of forces, momentum, and energy), study primary texts in translation, and examine existing structures and designs. Topics include evolution of engineering and engineered materials (metals, wood, stone, marble, glass, concrete, composites) and their limitations; Bronze Age fortifications; structural design of ancient temples; Roman aqueducts, siphons, and vaulted structures; engineering structural materials, stresses, and failure; lifting devices; construction engineering; columns, beams, vaults, trusses, frames; instruments of warfare, ballistics, and sea transport. (Spring)

**ME 145 CNC Grinding for Precision Manufacturing.** The course provides a basic understanding of Computer-Numerically-Controlled (CNC) machining and deterministic microgrinding manufacturing processes for spherical and aspheric surfaces for precision engineering applications. A hands-on project and technical report are important components of the course. (Fall, Spring, and Summer) (2 credits)

*For more information, go to [hajim.rochester.edu/me/](http://hajim.rochester.edu/me/).*



## MEDIEVAL AND EARLY MODERN STUDIES

(MULTIDISCIPLINARY STUDIES CENTER)



### Information about the Program

The minor in medieval and early modern studies enables students to pursue a program in the historical and cultural production of Europe and the Mediterranean from the fall of the Roman Empire and the rise of Islam to the mid-17th century. This period comprises distinct thematic continuities understood to be post-classical and pre-Enlightenment, and the program is intended to be multidisciplinary.

The medieval and early modern studies minor requires six courses, one of which must be Classical and Scriptural Backgrounds. At least three of the six courses should be at the 200 level or above. A maximum of four courses may be taken from any one academic department, and at least four of the six courses for the minor need to be in either the humanities or social sciences division. For more information, go to [www.rochester.edu/college/msc/medievalminor.html](http://www.rochester.edu/college/msc/medievalminor.html).

### Courses

#### AH 101 Introduction to Art and Visual Culture. (*Humanities*)

This course is designed to introduce the student to aspects of the history of Western painting, sculpture, and architecture from the Renaissance through the present. We examine the various schools and movements in their historical contexts while paying particular attention to the histories that bear upon them, such as the influence of the classical past, religion, gender, political power, and the rise of the artist. The course, therefore, attempts two goals: one, to familiarize students with the principal monuments of the Western tradition from about 1400 onward; two, to develop visual literacy, that is, the ability not only to identify but also to discuss artworks in a way that develops critical competence and an understanding of how the Western tradition of art has come about. (Fall)

**ENG 112 Classical and Scriptural Backgrounds.** (*Humanities*) Homer, Virgil, and Ovid. Greek tragedy and comedy: Aeschylus, Sophocles, Euripides, and Aristophanes. The Hebrew Bible—Abraham and Isaac, Moses and Pharaoh, Esther and Judith—and

Christianity's New Testament. The two great traditions studied in this introductory course—classical and Biblical—have been pondered by generations of writers and artists for thousands of years. The goal of this class is to read as much as possible of the classical and scriptural tradition in the short time we have, giving you a solid introduction to some of the key stories and ideas that have generated so much thought, conflict, and human creativity over the past two dozen centuries. First-years welcome! (Fall)

**ENG 113 British Literature I.** (*Humanities*) This course immerses students in the most challenging, influential, and engaging writings from the earlier periods of English literature. Our aim is to enjoy and understand these writings in themselves and then to see their relation to each other and to their larger historical context. Students should leave the course with some real affection for particular writings and some assured sense of the contours and highlights of cultural history. Our emphasis is on the careful appreciation of language and texture in representative texts and authors (including Chaucer, Spenser, Shakespeare, Donne, Jonson, Milton, Dryden, Swift, Pope, and their contemporaries). Class proceeds by lecture and discussion. (Fall)

**IT 195 Dante's *Divine Comedy*: A Journey from Inferno to Paradise, Part I.** (*Humanities*) The first of a sequence of two, the course approaches *The Divine Comedy* both as a poetic masterpiece and as an encyclopedia of medieval culture. Through a close textual analysis of "Inferno," and the first half of "Purgatorio," students learn how to approach Dante's poetry as a vehicle for thought, an instrument of self-discovery, and a way to understand and affect the historical reality. Class format includes lectures, discussion, and a weekly recitation session. Intensive class participation is encouraged. Dante Part I can be taken independently from Dante Part II. No prerequisites. First-year students are welcome. (Fall)

**REL 101 Introduction to the Old Testament.** (*Humanities*) Examination of the texts of the Hebrew Bible (Old Testament for Christians) in their religious, historical, and literary contexts. In this course, students learn the history of the ancient Israelite people from their origins down through the post-Exilic period. Study of the texts of the Hebrew Bible (Old Testament) enable us to explore what we can know about ancient Israelite society and culture, the rise and fall of Israel as a nation-state, religious and theological debates about the role of God in shaping history, and the problem of suffering, as well as the writing of the biblical texts and the development of the canon. (Fall)

**REL 104 History of Christianity.** (*Humanities*) The purpose of this course is to explore the general development of Christianity throughout its 20 centuries of existence, paying special attention to the religious presuppositions behind Christianity and its complex relationship to its socio-cultural matrix. The course focuses on important moments in Christian history, including its inception as a Jewish religious movement set in motion by Jesus, its dissemination in the Greco-Roman world by Paul of Tarsus, its growth and triumph in the Roman Empire, the split between the Greek- and Latin-speaking churches, medieval Catholicism, and the tendencies within the Christian churches. (Fall)

**REL 107 History of Islam.** (*Humanities*) The development of Islam from its origins in the Reformation and rise of Protestantism, Christianity and the modern world, and contemporary movements

and Qur'an and Muhammad's teachings, through the codification of the classical tradition in its various forms and finally to the living Islam of the contemporary world. (Fall)

**Note:** *The following courses may have appropriate content but have not been officially approved for the medieval and early modern studies minor. Please see one of the faculty advisors for approval.*

**HIS 127 Foundations of Medieval France.** (*Social Sciences*) This course provides an introduction to the study of history through an investigation of “the long 12th century” in France, using both primary and secondary source materials, discussion, analytic reading, and good practice of the writing of history. (Fall)

**HIS 196 Crusade, Jihad, and the Medieval Mediterranean World.** (*Social Sciences*) The Crusades are one of the most misunderstood events in Western history. This course addresses modern caricatures of the Crusades by introducing students to the full range of political, social, and religious issues involved. Students are encouraged to see the Crusades as a Mediterranean-wide phenomenon, including encounters between Christians and Muslims in the Iberian Peninsula, Sicily, and the Levant. (Fall)

**For more information, go to [rochester.edu/college/msc/medievalminor.html](http://rochester.edu/college/msc/medievalminor.html).**

## MODERN LANGUAGES AND CULTURES



*“What sets worlds in motion is the interplay of differences, their attractions and repulsions. Every view of the world that becomes extinct, every culture that disappears, diminishes a possibility of life.”*

—Octavio Paz

*“He who does not know foreign languages does not know anything about his own.”*

—Johann Wolfgang von Goethe

*“A different language is a different vision of life.”*

—Federico Fellini

## Information about the Department

International and multicultural by definition, the Department of Modern Languages and Cultures offers courses in many of the

world's major languages, literatures, and cultures and in comparative literature and theory. Students studying in MLC—as the department is commonly known around campus—acquire practical skills (proficiency in a foreign language, analytical reading and writing skills, the ability to think globally) and engage in intellectual inquiry into the culture, literature, art, and cinema of countries in Latin America, Europe, and Asia. Students can major in French, German, Japanese, Russian, Spanish, or comparative literature. Students interested in Chinese or Italian may create an interdepartmental concentration through the Multidisciplinary Studies Center. MLC also offers elementary and intermediate levels of Portuguese and elementary through advanced levels of Korean.

All MLC majors and minors (except Japanese) begin counting courses toward the major with 151, the third semester of study, following 101–102. A major in a modern language field entails the study of a national culture, literary traditions and innovations, and, of course, language. Students with an interest in a modern culture or language can also choose to minor in any of the above fields, including Italian and Chinese. There are also several possibilities for interdisciplinary work in other languages and cultures: Russian studies (a major and a minor), Latin American studies (a minor), and certificates in Asian studies, literary translation studies (LTS), and Polish and Central European studies.

Students with an interest in national literatures and cultures will find courses taught in English under the comparative literature (CLT) rubric (for example, RUS 231/CLT 255A Great Russian Writers). Courses in comparative literature and cultural theory examine the politics, philosophy, history, and general cultural context of works of art, cinema, theater, popular culture, and literature. CLT courses encourage interdisciplinary work, especially with African and African-American studies; art history; film and media studies; gender, sexuality, and women's studies; history; Jewish studies; and religion and classics. The major and minor in comparative literature offer an opportunity to compare and contrast theories of literature and culture in a global context. MLC welcomes students with primary interests in fields other than literature, whose diverse backgrounds and viewpoints enrich our exploration of interdisciplinary and cross-cultural studies.

### Departmental Advice for First-Year Students

The study of languages and cultures opens minds and attitudes and enables people to break down boundaries in daily life, business, science, and the arts. In MLC, you can begin study of a modern language, continue work in a language you have studied elsewhere, or pursue advanced studies in the literatures and cultures of the world. The department also encourages you to make use of the diversity of its offerings to enhance your studies in other fields. Language advisors can help you design a program of study in language, literature, and culture that fits your particular interests. If you major in the sciences, history, political science, anthropology, or other social sciences or any of the College's humanities programs, MLC has courses that enhance your program of study and distinguish you as speakers of other languages.

The fall semester is the best time to begin or to continue with the study of a language and culture, as all the national programs in the department offer elementary and intermediate courses at the start of the year. Students with no previous experience in a particular language may enter any 101 course; placement is necessary for all other



language courses and levels. The 101 and 102 undergraduate courses constitute the first year of language study. Courses numbered 151–153 are at the intermediate or second-year level. Courses at the 200 level require placement as well.

**For Students with Previous Language Training**

The College Board Subject Test Advanced Placement scores or International Baccalaureate rankings assist departmental advisors in finding the right course level for you. Information on how you learned the language or languages you know will also help us advise you on the most appropriate courses for you in the Department of Modern Languages and Cultures. The first step is to take the online placement exam for Chinese, French, German, Russian, or Spanish. (For Italian, Japanese, Korean and Portuguese, contact the particular program’s advisor.) For the online placement exams in Chinese, French, German, Russian, or Spanish, you will receive a score that will be used along with the survey information you provide and with any AP or IB scores you have submitted that will help determine your placement in a specific language course. Please note that any semester placement you may receive with your online numerical test scores are not University of Rochester placement rubrics. For Italian, you should discuss your score with the undergraduate advisor in the program.

**Credit for Advanced Placement and International Baccalaureate Courses**

All students who wish to continue their study of French, German, or Spanish at the University of Rochester *must* take the MLC placement test, and the department will make a placement. There is no self-placement based on an IB or an AP score.

AP Credit	Score	Placement
<b>French (Literature and Languages)</b>	<b>5</b>	Potential placement in FR 200. Credit granted for FR 153 upon completion of FR 200 with a grade of “B+” or better.
<b>German (Literature and Languages)</b>	<b>4 or 5</b>	Potential placement in 152 or 200. Credit granted for 151 upon completion of 152 with a grade of “B+” or better. Credit granted for 151 and 152 upon completion of 200 with “B+” or better.
<b>Spanish (Literature and Languages)</b>	<b>4</b>	Potential placement in SP 152. Credit granted for SP 151 upon completion of SP 152 with a grade of “B+” or better.
	<b>5</b>	Potential placement in SP 200. Credit granted for SP 151 and SP 152 upon completion of SP 200 with a grade of “B+” or better.

**IB for Spanish**

**IB Higher-Level 5:** Potential placement into 152 with credit awarded for 151 after completion of 152 with a grade of B+ or better.

**IB Higher-Level 6, 7:** Potential placement into 200 with credit awarded for 151 and 152 upon completion of 200 with a grade of B+ or better.

**MLC Clusters**

Completion of a cluster of three courses in MLC fulfills the humanities requirement for graduation. In addition, Russian studies offers several humanities and one social sciences cluster. Each language program in the department offers clusters at the beginning, intermediate, and advanced levels, as well as others based on specific topics or themes, so any course you choose in MLC will fit into one or more clusters. Comparative literature and the national language programs offer clusters focusing on literary studies, cultural theory, and interdisciplinary topics. A few examples are Comparative Cultural Studies, Studies in Francophone Cultures, Italian Studies on Location, Germany before Nazism, Japanese Popular Culture, Russian Literature and Culture, and Literature and Identity in Hispanic Societies. Some of these are interdepartmental and include MLC courses plus offerings in history; art and art history; music; anthropology; film and media studies; and gender, sexuality, and women’s studies. A couple examples are Introduction to European Studies and Continental Philosophy.

**Special Opportunities: Study Abroad**

MLC strongly encourages students to take advantage of the many opportunities for study abroad in a variety of places around the world. There are opportunities to take classes abroad or to do internships related to one’s interests, and many if not all of the courses taken abroad can count toward MLC majors and minors. Returning study abroad students consider the time spent in another country as one of the most exciting and challenging experiences of their undergraduate education. The College sponsors several University of Rochester programs and is affiliated with others, such as the Paris Film Program; the IES programs in Salamanca, Granada, Barcelona, and Madrid; in Paris and Nantes; the St. Petersburg CIEE program; and the IES programs at several universities in China and Japan. MLC also offers a one-semester, interdisciplinary program in Italian studies in Arezzo, Italy. This program is directed by College faculty and administered through the Center for Education Abroad.

MLC-sponsored summer programs take students to France, Germany, Italy, Korea, Russia, and (in even-numbered years) a Spanish-speaking country. You do not have to major in a modern language in order to participate in these programs, but it is important to plan in advance with an MLC advisor in your field of interest. Advisors in each of the language programs help students pick the study abroad offerings best suited to their interests and language abilities. MLC also sponsors a yearlong exchange program with the University of Cologne and the University of Rennes. University of Rochester financial aid is transferable for many study abroad and internship opportunities. Through MLC, students taking courses in the department may also apply for a Mildred R. Burton Undergraduate Travel/Research Fellowship. Each year, many students are awarded fellowships to use toward our study abroad programs.



## Courses

The Department of Modern Languages and Cultures currently offers introductory through advanced courses in Chinese, French, German, Italian, Japanese, Korean, Russian, and Spanish, as well as introductory and intermediate courses in Korean and Portuguese. This enables students to begin a new language or continue in a familiar one beginning with their first semester. Other courses, such as those listed here, provide more-advanced studies of other literatures and cultures.

*Spring courses have yet to be determined. The following courses are taught in English and have no prerequisites:*

**CHI 218 Introduction to Chinese Popular Culture.** This course introduces contemporary Chinese popular culture. It explores popular culture's relations to social change, Chinese traditional values, Chinese schools of thought, questions of national identity, and globalization. The course includes topics in current Chinese media, such as dynastic dramas, contemporary documentaries, and Chinese web-based novels. (Fall)

**FR 204 Contemporary French Culture.** This course is designed to provide students with a comprehensive view of French Contemporary culture through major trends of French cultural, political, and intellectual life in recent years. While we cannot study factual representations of French culture, we attempt to establish a conceptual framework that would help us in the understanding of complex questions such as What does it mean to be French? What is France? What is French culture?, etc. (Fall)

**GER 230/CLT 242A Poe and Hoffman: Uncanny Stories.** This course explores the beginnings of the horror and detective genres in the 19th century. Particular attention is devoted to the narrative structure, tropes, and psychological content of the strange tales by Poe and Hoffmann. Theories of horror are also addressed to include discussions by Lessing, Todorov, Huet, and Kristeva. (Fall)

**IT 197/225/CLT 118/253F/ENG 206/HIS 135/REL 193/REL 282 *The Divine Comedy* of Dante Alighieri: Discover the Wonders of a Medieval Mind.** The course approaches *The Divine Comedy* both as a poetic masterpiece and as an encyclopedia of medieval culture. Through a close textual analysis of selected cantos from *Inferno*, *Purgatorio*, and *Paradiso*, students learn how to approach poetry as a vehicle for thought, an instrument of self-discovery, and a way to understand and affect the world. (Fall)

**JPN 214/JPN 214W/CLT 214M/CLT 214W/ENG 259/FMS 299 Atomic Creatures: Godzilla.** A focused study of Godzilla on film, beginning with the 1954 film that inspired and helped define the Japanese *kaiju eiga* genre. The larger context of the course is a critical investigation of genre film, specifically the science-fiction/horror/creature-feature film, and a careful consideration of the "culture of war" (World War II through 21st century). We begin with a sampling of seminal non-Japanese titles that provided the foundation for the Godzilla film paradigm and then focus on a close textual study of select "Godzilla films" that help us understand the historical and social contexts for Godzilla's erratic trajectory since 1954.

### RUS 252 Hipsters, Rebels, and Rock Stars in Russian

**Literature and Culture.** Images of dandies, fops, and rebels have steadily resurfaced in Russian art and literature during periods of major political and cultural change, creating both a striking counter-narrative to the established social norms and shaping new currents of thought and artistic expression. Special attention is given to the comparative investigation of artistic media as vehicles for the multivalent, ambiguous, and often contradictory portrayal of "the hipster" as both a cultural hero and an outsider, in turn mapping out the ideological nucleus of the imperial, totalitarian, and capitalist mainstreams.

**SP 277 Mexico, DF: Global Metropolis.** Called by some "the capital of the 21st century," Greater Mexico City is inhabited by close to 20 million people. The Distrito Federal (DF) and capital of Mexico is today the largest metropolitan area in the western hemisphere and third largest city in the world by population. Established by the Spanish in 1524 on the ruins of the Aztec city Tenochtitlán they had destroyed, Mexico City is a global center of finance, culture, and industry. This course examines the development of this vibrant megalopolis over the 20th and 21st centuries using literature, film, politics, tourism, music and the arts, cultural geography, architectural space, and essays by urban wanderers to try and get a handle on a space that seems to contradict itself at every turn. (Fall)

### Intermediate and Advanced Language and Conversation Courses

CHI 114	Conversational Chinese I (Fall)
CHI 115	Conversational Chinese II (Spring)
CHI 116	Introduction to Classical Chinese II (Spring)
CHI 151	Intermediate Chinese I (Fall)
CHI 152	Intermediate Chinese II (Spring)
CHI 202	Advanced Intermediate Chinese I (Fall)
CHI 203	Advanced Intermediate Chinese II (Spring)
CHI 205	Advanced Chinese I (Fall)
CHI 206	Advanced Chinese II (Spring)
FR 153	Intermediate French (Fall and Spring)
FR 155	French Conversation and Composition (Fall and Spring)
FR 200	Advanced French (Fall and Spring)
FR 211	Aspects of French Grammar (Fall)
GER 151	Intermediate German I (Fall)
GER 152	Intermediate German II (Spring)
GER 200	Advanced German Conversation and Composition (Fall)
IT 114	Conversational Italian (Fall and Spring)
IT 151	Intermediate Italian I (Fall)
IT 152	Intermediate Italian II (Spring)
IT 200	Advanced Italian Composition and Conversation (Fall)
JPN 114	Intermediate Conversational Japanese I (Fall)
JPN 115	Intermediate Conversational Japanese II (Spring)
JPN 151	Intermediate Japanese I (Fall)
JPN 152	Intermediate Japanese II (Spring)
JPN 201	Advanced Intermediate Japanese I (Fall)

JPN 202	Advanced Intermediate Japanese II (Spring)
JPN 203	Advanced Conversational Japanese I (Fall)
JPN 204	Advanced Conversational Japanese II (Spring)
JPN 205	Advanced Japanese I (Fall)
JPN 206	Advanced Japanese II (Spring)
KOR 151	Intermediate Korean I (Fall)
KOR 152	Intermediate Korean II (Spring)
KOR 201	Advanced Intermediate Korean I (Fall)
KOR 202	Advanced Intermediate Korean II (Spring)
POR 151	Intermediate Portuguese I (Fall)
POR 152	Intermediate Portuguese II (Spring)
RUS 110	Conversational Russian (Fall)
RUS 151	Intermediate Russian I (Fall)
RUS 152	Intermediate Russian II (Spring)
RUS 202	Advanced Readings in Russian I (Fall)
RUS 209	Advanced Russian through Film (Spring)
SP 151	Intermediate Spanish I (Fall and Spring)
SP 152	Intermediate Spanish II (Fall and Spring)
SP 200	Advanced Spanish Composition (Fall and Spring)

**For more information, go to [sas.rochester.edu/mlc/](http://sas.rochester.edu/mlc/).**

## MUSIC



*“The man that hath no music in himself Nor is not mov’d with concord of sweet sounds, Is fit for treasons, stratagems, and spoils; The motions of his spirit are dull as night, And his affections dark as Erebus. Let no such man be trusted.”*

—William Shakespeare

### Information about the Department

Students from all disciplines may participate in the pleasures of musical study and performance to acquire a deeper understanding of the many ways music reflects values of various cultures, influences lives, and enriches human existence. The Department of Music in the College offers courses of study leading to the BA degree with a

major, a minor, and seven clusters in music. Numerous varied courses address non-majors who wish to study music on an introductory, interdisciplinary, or aesthetic basis. Degree programs, course offerings, and performance opportunities in music are diverse and invite choice and flexibility. Courses offered at the Eastman School of Music, normally open to any student presenting the proper prerequisites, augment the range and depth of musical experiences and courses available to students in the College.

Full-time, matriculated undergraduate students who perform at an intermediate level (not a beginner) and pass an entrance audition may take applied music lessons at Eastman. Interested students should visit [esm.rochester.edu/lessons](http://esm.rochester.edu/lessons) and sign up for an audition, preferably before August 15. Students with questions about lessons and/or the audition process should visit [sas.rochester.edu/mur/undergraduate/lessons.html#lessons](http://sas.rochester.edu/mur/undergraduate/lessons.html#lessons). Beginning music lessons are available without credit and for a fee through Eastman’s Community Music School. Call (585) 274-1400 or visit ECMS online at [esm.rochester.edu/community](http://esm.rochester.edu/community) for more information.

More than 400 students play or sing in more than a dozen offered credited ensembles. Auditions for all of these ensembles take place during the first week of school. For audition information, visit the Music Ensembles page at [sas.rochester.edu/mur/ensembles/index.html](http://sas.rochester.edu/mur/ensembles/index.html).

The formal study of music at the collegiate level interrogates the dynamic relationship among composer, performer, and listener in various cultural contexts and historical frames. For creators and audience members alike, music can be both a cultural practice/artifact and an aesthetic experience. To that end, the College music department offers a balanced curriculum that addresses performance (through private studio instruction and ensemble participation), theoretical and historical investigation, and experiential learning about the musical process.

The study of the musical experience, often broadly called “musicology,” encompasses many diverse fields of inquiry, including theory and analysis of musical languages, styles, and works; historical and critical discourse about repertoires, genres, and periods; composition and improvisation; musical perception; music education; performance practices; cultural contexts and reception.

### Department Contacts

First-year student advisor: Professor Matthew BaileyShea, [matt.baileyshea@rochester.edu](mailto:matt.baileyshea@rochester.edu)

Administrative questions: Elaine Stroh, [estroh@ur.rochester.edu](mailto:estroh@ur.rochester.edu)

Ensemble and studio lessons: Jimmy Warlick, [jwarlick@ur.rochester.edu](mailto:jwarlick@ur.rochester.edu)

### Departmental Advice for First-Year Students

Every student at the University of Rochester should take at least one music course during his or her four years here. Music department courses accommodate a wide range of interests for students with no background in music to those interested in making music their livelihood. We strongly encourage students considering a major in music to take music theory during their first year. See “Courses” for a list of classes open to first-year students.

Students interested in registering for a music theory course should take the theory placement assessment. This brief assessment

is held in Dewey Hall during first-year student orientation week (in 2019 on Thursday, August 22 at 1 p.m. in Dewey 1.101). If you plan to take any music theory courses during your time at the University, you are strongly advised to take this short assessment.

Students who read music and perform at an intermediate level can audition for applied music lessons by visiting [www.esm.rochester.edu/lessons](http://www.esm.rochester.edu/lessons) and signing up for an audition prior to the first week of classes. Note to brass musicians—unlike other instrumental areas, the brass auditions include musical excerpts to be prepared in advance. Please contact the performance program manager in the music department to obtain PDF files of the required excerpts.

### The BA with a Major in Music

The College's bachelor of arts degree in music addresses students who can meet both the intellectual and musical challenges of a rigorous program that emphasizes the broad experience of a liberally educated person. The concentration comprises a balanced program of academic courses, private instruction, and ensemble experience that fosters understanding of musical languages, historical developments, and compositional styles while encouraging excellence in performance.

Students may choose from among eight individual “tracks” of study with the core curriculum in music theory and history, included in all tracks, providing the common foundation for advanced study of specialized subfields in music (musicology, theory, conducting, management, performance, composition, music education, etc.) both as emphases in the final years of undergraduate education and at the graduate or professional level. Majors wishing to pursue something other than the basic track can choose an alternative track in composition, conducting, music history/theory, music in world cultures, musical theater, performance, and popular music/jazz.

Any student interested in a 3-2 program in ethnomusicology should contact Professor Jennifer Kyker. Students interested in the BA/MA combined program with certification in music education should contact Christopher Azzara at the Eastman School of Music during Orientation or soon afterward. Both options are offered in conjunction with the Eastman School.

Although the major in music is a demanding one, students often also explore, beyond the introductory level, one or more nonmusic disciplines. Some students pursue a double major. Such flexibility allows students to combine pre-law or pre-medicine preparation with a major or minor in music.

First-year students who plan to major in music should take the theory placement assessment to determine appropriate placement in the theory curriculum. Prospective majors should also audition for applied music lessons and an ensemble.

### Advanced Placement (AP)

Students who have taken the Advanced Placement examination in Music Theory and earned a score of 4 or 5 can receive advanced placement credit for the course MUR 110.

### Music Clusters

Students whose major is in the social sciences or natural sciences and engineering divisions are invited to pursue one of the six music clusters:

#### Music Theory (H1MUR001)

Grammar and syntax of Western music, including notation, harmony, counterpoint, and some composition.

#### Introduction to Classical Music (H1MUR013)

Explores Western art music from a variety of perspectives, including music theory, history, and performance.

#### Popular Music (H1MUR014)

Explores various styles and forms of popular music in Western culture.

#### World Music (H1MUR017)

An introduction to non-Western music.

#### Musical Styles and Ideas (H1MUR016)

A diverse array of repertoires and approaches to the musical experience.

#### The Performing Musician (H1MUR011)

A hands-on approach to the experience of music.

#### Music, Culture, and Understanding (H1MUR018)

Provides an introduction to music as a window on cognition and culture.

## Courses

**Applied Music Lessons.** Each year, approximately 250 non-music majors on the River Campus take private instrumental or vocal lessons for credit at the Eastman School of Music. All full-time, matriculated undergraduate students who read music and perform at an intermediate level and pass an audition are eligible. During the semester, students meet with their instructors once each week, receiving collegiate credit for their lessons. The addition of the lesson to a normal 16-credit-hour semester schedule is not considered an overload.

### First-Year Students

*Courses Open to First-Year Students—please review Course Descriptions/Course Schedules (CDCS) for other suitable courses*

**MUR 100 Experiencing Music.** A “music appreciation” course that celebrates the “ears-on” experience of various aspects of musical performance. Participants develop listening skills through live musical presentations, in-class performances, discussions with the performers and living composers, and guided listening sessions. Students attend some rehearsals and concerts, including at least one Rochester Philharmonic concert at the Eastman Theatre. Websites and other technological media also are used in lieu of text. (Spring, alternate years)

**MUR 101 Elements of Music.** A course for the student with no previous musical experience. Topics include notation, intervals, chords, and other basic concepts of tonal harmony, with application to the study of a wide range of styles, including popular idioms. Students should not be able to read music. Prerequisite for MUR 111. For the student with no previous musical experience. (Fall and Spring)

**MUR 103 Musical Adventures (Too Hip a Trip to Miss).** Explores the wonderful world of music from Bach to Coolio. Explor-



ing questions such as “What is music?” and “Why humans make it?” We’ll find out what one another of us thinks is musically “mint” and musically “gross” and why. From concert halls to church halls; beer halls to dance halls, we’ll go in search of music. Prerequisites: none. (Spring)

**MUR 104 Carillon.** Private carillon instruction, weekly 30-minute lessons or the equivalent. By audition only. Permission of instructor required. (2 credits)

**MUR 109 Musicianship I: Literacy Skills.** Extensive work with clefs, notation, intervals, and scales. Aural work through sight singing and dictation emphasizing melody and rhythm. Music-reading work emphasizes speed and fluency in recognizing structures in musical score. Prerequisite: some prior experience in reading music notation in treble and bass clefs. (Fall and Spring) (1 credit)

**MUR 110 Introduction to Music Theory.** Basic concepts of music theory addressing students with some musical experience in an instrument or voice but little or no music theory. Scales, keys, intervals, chords, basic part-writing, and other fundamental aspects of musical structure. Some ear training and aural skills. Prerequisite: ability to read music, preferably in both treble and bass clefs. (Students who have completed MUR 101 should not register for MUR 110.) (Fall)

**MUR 111 Theory I.** The first in a four-course sequence. Deals with basic elements of harmony, voice-leading, and analysis. Part-writing in chorale style teaches elementary aspects of tonal theory. Prospective music majors should begin their theory requirement with this course. Prerequisite: MUR 101 or 110; or permission of instructor (placement test). (Fall only)

**MUR 113 Musicianship II.** This course develops basic musician-ship skills with an emphasis of diatonic sight-singing, rhythmic sight-reading, and dictation of diatonic melodies and chord progressions. The exercises and in-class activities are similar to MUR 109 but at a more advanced level. (Fall and Spring)

**MUR 118 Beginning Piano for Non-Music Majors I.** Elective course for non-music majors from River Campus with no previous keyboard instruction and cannot read music. The course includes technique, fundamental skills, and repertoire. *Note:* Seating is limited due to keyboard availability; no additional students will be accepted once the sessions are full. Classes are held at the Eastman School of Music Campus. See the school’s website for information on start date, cancellations, etc.: [www.esm.rochester.edu/classpiano/](http://www.esm.rochester.edu/classpiano/). (Fall only) (2 credits)

**MUR 119 Beginning Piano for Non-Music Majors II.** Continuation of MUR 118. See note at MUR 118 above. (Spring) (2 credits)

**MUR 120 Symphony and the Conductor.** Glimpses into the world of standard performance and an overview of the *métier* of the orchestra conductor. In addition to the ability to read music and knowledge of basic theory, the participants must have a love for and active interest in symphonic music. Prerequisites: MUR 111 or permission of instructor.

**MUR 121 World Music in Context.** In this introductory course, students engage with a variety of musical genres, instruments, and performance techniques from different areas of the world. Through

reading assignments, listening examples, film clips, and participatory activities, students study how people in different places engage with music as a sonic and social practice. Students also learn how to write about music as a form of social practice through short reading responses and structured essay assignments.

**MUR 122A History of Jazz.** This study of jazz as an American musical art form is structured around the lives and music of jazz musicians across a range of instrumental, vocal, and ensemble genres. Course focuses on jazz titans, those individuals and musical groups distinguished by their seminal and permanent influences, such as Louis Armstrong, Miles Davis, or Coleman Hawkins or shorter intense careers, such as Charlie Parker. Blues, ragtime, swing, bebop, cool, progressive, and free jazz are landmark terms. And finally, study of the musical history is enhanced by considerations from sociological, linguistic, and philosophical perspectives. The instructional format includes lectures, discussion, and intense emphasis on listening. This course is designed for students with little or no musical training; simple technical, musical vocabulary and concepts will be provided. Reading, listening assignments, brief written assignments, and two exams. Prerequisites: none. (Fall only)

**MUR 122B History of Jazz II.** This course focuses on jazz music and musicians in the latter half of the 20th century (ca. 1955–2000). We investigate the relationship of jazz to the following topics: new musical styles; other art forms; changes in American society; technological developments; and the evolution of recording, broadcast, and news media. In doing so, we consider not only musicians who first emerged as leaders during this period (Ornette Coleman, John Coltrane, Bill Evans, Herbie Hancock, Keith Jarrett, Chick Corea, Wynton Marsalis, John Scofield) but also those whose careers began earlier (Louis Armstrong, Dizzy Gillespie, Miles Davis, Gil Evans) and continued into the 1950s and beyond. We also examine how repertoire from previous historical periods came to be viewed by subsequent generations of musicians and listeners. The instructional format includes lectures and discussion along with in-class viewings/listenings of recorded performances. This course is designed for students with little or no musical training. The coursework consists of assigned readings, listenings, brief written assignments, and two exams. Prerequisites: none.

**MUR 123 Music of Black Americans.** The course studies the Black American Christian musical beginnings and includes forms of worship, early musical practices, the Spiritual, evolution of Gospel. An examination of antebellum musical activities follows, including secular song types, character of the folk music with respect to poetic and musical form, language, and themes. Attention is given to significant literary and aesthetic developments, especially during the Harlem Renaissance and the poetry of several writers of that era are surveyed. The course treats blues, its origins, and its evolution through the 1940s. Surveys of classical music forms from the 18th to mid-20th century; music of the theater from minstrelsy to Broadway; precursors of jazz, the syncopated dance orchestra and brass bands; early jazz to bebop round out the course offerings. (Spring only)

**MUR 124 Signed, Sealed, and Delivered: Deals and Innovations that Changed the Music Industry Forever.** A look at the historical deals and innovations that have impacted the music business between 1877 and the present. From groundbreaking inven-

tions to brilliant marketing initiatives to hushed back-room deals, this course exposes the key moments where the record industry changed forever, both for good and for bad. (2 credits)

**MUR 125 History of Rock Music.** This course explores the history of rock music, emphasizing the period between 1955 and 1990. The periods preceding (1900–55) and following (1990–present) are considered to a limited extent. Discussion and reading focus mostly on the music, identifying a wide variety of rock music styles within the historical context of the development, transformation, and interaction of pop styles of these decades in general. Issues of technological development, social, political, and cultural context, race and gender, and music business practices are considered also. Prerequisites: none. Knowledge of technical musical terms and an ability to read music are not required for this course. (Spring)

**MUR 126 Opera.** A small number of representative operas are used to highlight the history of this controversial 400-year-old art form and its creators, performers, and audiences. Drama, music, staging, spectacle, and dance are examined as components of production. Divas welcome. Prerequisite: ability to read music.

**MUR 127 The Blues.** See online course description for REL 151.

**MUR 128 Women and Music.** This course focuses primarily on women composers but also includes material on women as performers, patrons, and consumers, as well as consideration of the role that gender plays in the experience of music. Prerequisites: none.

**MUR 129 The Rolling Stones and British Blues-Rock.** The music of the Rolling Stones is examined, starting with the earliest music from 1962 and extending to the early 1970s. Emphasis is on the band's stylistic development, as well as on the British blues movement of the early to mid-1960s. The music of other blues-based British groups, including Blues Incorporated, the Yardbirds, the Animals, the Bluesbreakers, Cream, and Led Zeppelin, also are considered. No previous training or ability to read music is required.

**MUR 130 The Beatles, the British Invasion, and Psychedelia.** The history of the Beatles' career and music is explored in the context of the band's stylistic development, as well as against the backdrop of social, cultural, technical, and music-business events and issues in the 1950s, 60s, and 70s. No background in music theory or ability to play a musical instrument is required. (Fall)

**MUR 131 Rock Music of the 1970s.** This course surveys rock music in the 1970s, paying special attention to ways in which 70s' styles developed out of 60s' styles. Artists considered include Jimi Hendrix, Cream, Yes, Led Zeppelin, the Who, the Allman Brothers, the Eagles, Black Sabbath, the Cars, Tom Petty, the Sex Pistols, and Elvis Costello, plus many more. No previous musical training is required. (Fall)

**MUR 132 Star Makers.** Includes a historical overview of music stars and the publicity campaigns used to promote their careers. From Frank Sinatra through the 1940s; through Elvis Presley and the 1950s; through the Beatles and the Rolling Stones in the 1960s; through the self-indulgent '70s with acts like Elton John, Kiss, and Prince; up to today's high-profile campaigns for Justin Bieber, Rihanna, and Lady Gaga. Students will be versed in the art of writing an artist bio, press releases, and in the various types of PR events staged to gain publicity. Starmakers also looks at the various types of pub-

licity, such as career launching, crisis management (scandals, sudden death of celebrity), and tour press. We also look at how social media has become a game changer for music publicity.

**MUR 135A American Musical Theater.** A historical and critical survey of the Broadway musical with a focus on its so-called Golden Age (from *Oklahoma!* to *Cabaret*). Weekly listening, reading, and video assignments with analysis of dramaturgy, lyric and musical forms, process of adaptation and production, modes of performance. Prerequisite: ability to read music or strong background/interest in musical theater. (Spring, alternate years)

**MUR 135B Sondheim and the Modern Musical Theater.** A historical and critical survey of the American musical theater from roughly 1960 to the present as reflected principally in the works of composer/lyricist Stephen Sondheim and/or producer/director Harold Prince. Analysis of lyrics, musical forms and idioms, process of adaptation and production, modes of performance. Although prior completion of MUR 135A is recommended, students with a strong background in musical theater will be admitted as well. (Fall, alternate years)

**MUR 136 Exploring Classical Music.** This course offers a comprehensive overview of western classical music. We learn how genres and styles evolved from the Medieval through modern periods of music history and how the pieces of the past relate to and inform what we listen to today. A fun and approachable course for all; no prior musical knowledge or comprehension is required. Students should have a love and curiosity for classical music. This course includes the potential opportunity to observe a Rochester Philharmonic Orchestra rehearsal.

**MUR 140 Religion and Hip Hop Culture.** Religion is an often overlooked element in the study of hip hop culture. This course offers students the opportunity to examine the variety of ways religion finds expression in the dynamic cultural medium of hip hop.

**MUR 141 Introduction to Audio and Music Engineering.** The science and technology of the electric guitar and related accessories such as amplifiers and effects processors open a window onto the fields of audio, music, and electrical engineering.

**MUR 161 Media in the Digital Age.** This course offers a unique opportunity for students to engage critically with broadcasting and the supporting areas of the radio and television industries. Students participate in theoretical and practical applications in a selected area of focus at Rochester's public broadcasting organization, WXXI. These areas include production for news, *1370 Connections*, *Second Opinion*, and *Homework Hotline*; music, television, and audio engineering; and administrative support, including accounting, fundraising, web development, social media, and others. Weekly class meetings cover the basics of broadcasting, including the history, regulations, and formats of over-the air communications, along with an overview of the changes that digital media has brought to traditional broadcasting. (Spring only)

**MUR 201 Basic Jazz Theory and Improv I.** Rudiments of jazz, including chord and scale spellings, chord/scale relationships, jazz/pop chord symbol nomenclature, basic forms, chord substitutions, piano voicing; strong emphasis on ear training, vocalization, transcription from records of jazz solos. Prerequisite: MUR 111 or permission of instructor. (Fall only) (2 credits)

**MUR 202 Basic Jazz Theory and Improv II.** Continuation of MUR 201. Prerequisite: MUR 201 or permission of instructor. (Spring only) (2 credits)

**MUR 203 Susan B. Anthony and Her World.** See online course description for WST 201.

### Eastman Courses

In addition to those listed above, qualified students may take courses at Eastman. In general, introductory theory courses (MUR 111 and 112) are prerequisites for taking most Eastman music courses, and the instructor's permission is necessary to register.

### Ensembles

Auditions for performing ensembles occur during the first week of the academic year. During orientation, students may sign up for auditions on-line at [sas.rochester.edu/mur/ensembles/symphony-orchestra/index.html](http://sas.rochester.edu/mur/ensembles/symphony-orchestra/index.html) (preferred) or on sign-up sheets located in the music department in Dewey Hall across from 1.333 and 1.335. Contact Jimmy Warlick ([jwarlick@ur.rochester.edu](mailto:jwarlick@ur.rochester.edu)) for details. Students accepted into the groups may receive credit by registering for ensembles during the Drop/Add period. Those who complete the semester satisfactorily receive one credit and a grade.

*The following performing ensembles are available for credit:*

#### Instrumental Ensembles)

- MUR 153 Symphony Orchestra
- MUR 154 Chamber Orchestra
- MUR 155 Chamber Ensembles
- MUR 156 Wind Symphony
- MUR 157 Jazz Ensemble
- MUR 157A Jazz Combos
- MUR 159 Gamelan Ensemble
- MUR 165 Mbira Ensemble
- MUR 168 West African Drumming Ensemble
- MUR 170 Brass Choir
- MUR 175 Percussion Ensemble
- MUR 180 Rock Repertory Ensemble

#### Vocal Ensembles

- MUR 150 Women's Chorus
- MUR 152 Chamber Singers
- MUR 158 Gospel Choir
- MUR 160 Concert Choir

**For more information, go to [sas.rochester.edu/mur/](http://sas.rochester.edu/mur/).**

## MUSIC AND SOUND



*“Music is a science, certainly, in which exists sure and infallible knowledge, for whether we speak of it in terms of problems or effects, it would never demonstrate any change or alteration. And indeed, we might also with reason call it an art, for it is both a composite of perceptions...and is not useless to life.*

—Aristides Quintilianus  
*On Music* (late third century A.D.)

## Information about the Program

The music and sound program is a group of undergraduate curricular initiatives that grew out of a collaboration between faculty in the University's arts, sciences, and engineering disciplines and the Eastman School of Music. Music, science, and engineering play pivotal roles in the University of Rochester and in the broader Rochester community. The music and sound program provides opportunities for interdisciplinary study in these areas.

The music and sound program includes two minors and four clusters that explore and unite the topics of music theory and music processing; language structure and processing; the auditory system that processes both music and language; and cognition, the larger set of abilities of perception, memory, and learning that permit humans to appreciate and learn music and language. The core undergraduate course in music and sound is BCS 260 Music and the Mind. This course is a requirement for all minors and clusters. While one semester of music theory is a prerequisite for all students before taking BCS 260, students who are already taking music theory as part of a major or minor in music can take advantage of several clusters “designed for musicians.” These clusters encourage the student to pursue an additional course in language, linguistics, or cognition to round out their experiences, rather than simply overlapping with their knowledge of music theory.

### Advice for First-Year Students

Students interested in a cluster or minor in music and sound should consider completing one or more of the following during their first year: BCS 110, BCS 111, MUR 110, MUR 111, LIN 110, or TH 101/161 at Eastman (TH 101/161 for dual degree students only). Each of these courses is part of at least one cluster or minor.



**Advanced Placement**

Students who scored a 4 or 5 on the Advanced Placement Exam in Music Theory meet the prerequisite for BCS 260, Music and the Mind.

**Clusters and Minors**

Four clusters are available within the discipline of music and sound: Music and Linguistics for Musicians (S1MAS001) fulfills the social science divisional requirement; Music Cognition (N1MAS002), Music Cognition for Musicians (N1MAS001), and Music and Language for Musicians (N1MAS003) each fulfill the natural science divisional requirement. Details of these clusters can be found on the Cluster Search Engine or music and sound website. Two minors are available: a natural sciences minor in music cognition, or a social sciences minor in music and linguistics.

**Courses**

The following courses are part of the music and sound clusters. First-year students who complete BCS 110 or 111 during the fall semester may be eligible to take certain upper-level brain and cognitive sciences electives in the spring. Similarly, students who complete LIN 110 during the fall may be eligible to take 200-level linguistics courses in the spring.

**BCS 110 Neural Foundations of Behavior.** Introduces the structure and organization of the brain and its role in perception, movement, thinking, and other behavior. Topics include the brain as a special kind of computer, localization of function, effects of brain damage and disorders, differences between human and animal brains, sex differences, perception and control of movement, sleep, regulation of body states and emotions, and development and aging. Prerequisites: none. Part of clusters N1MAS001, N1MAS002, N1MAS003, and music cognition minor. (Fall and Spring)

**BCS 111 Foundations of Cognitive Science.** Introduces the organization of mental processes underlying cognition and behavior. Topics include perception, language processing, learning, and memory. Integrates knowledge of cognition generated from the fields of cognitive psychology, artificial intelligence, neuroscience, linguistics, and philosophy. Prerequisites: none. Part of clusters N1MAS001, N1MAS002, N1MAS003, and music cognition minor. (Fall and Spring)

**BCS 260 Music and the Mind.** Introduction to the discipline of music cognition. Topics include empirical methods; psychoacoustic principles; influence of Gestalt psychology; music and language; metric and tonal hierarchies; music and the brain; aspects of musical development; and research on musical memory, expectation, and emotion. Prerequisite: one semester of music theory or permission of instructor. Part of clusters N1MAS001, N1MAS002, N1MAS003, S1MAS001, music and linguistics minor, and music cognition minor. (Fall)

**MUR 110 Introduction to Music Theory.** Basic concepts of music theory addressing students with some musical experience in an instrument or voice but little or no music theory. Scales, keys, intervals, chords, basic part-writing, and other fundamental aspects

of musical structure. Some ear training and aural skills. Prerequisite: ability to read music, preferably in both treble and bass clefs. Part of cluster N1MAS002. (Fall)

**MUR 111 Theory I.** The first in a four-course sequence. Deals with basic elements of harmony, voice-leading, and analysis. Part-writing in chorale style teaches elementary aspects of tonal theory. Prospective music majors should begin their theory requirement with this course. Prerequisite: MUR 101 or 110; or permission of instructor (placement test). Part of cluster N1MAS002, music cognition minor, and music and linguistics minor. (Fall)

**LIN 110 Introduction to Linguistic Analysis.** Investigation of the structure of human language, covering the basic techniques and concepts in the subfields of contemporary linguistic analysis. The course emphasizes work in primary material and data analysis and focuses on developing skills in data collection and defining relevant questions to seek evidence to address theoretical and empirical questions in the analysis of language. Prerequisites: none. Part of clusters S1MAS001, N1MAS003, and music and linguistics minor. (Fall and Spring)

*For more information, go to [sas.rochester.edu/mas/](http://sas.rochester.edu/mas/).*

**NAVAL SCIENCE**

*“For in this modern world, the instruments of warfare are not solely for waging war. Far more importantly, they are the means for controlling peace. Naval officers must therefore understand not only how to fight a war, but how to use the tremendous power which they operate to sustain a world of liberty and justice, without unleashing the powerful instruments of destruction and chaos that they have at their command.”*

—Admiral Arleigh Burke

**Information about the Department**

Naval Reserve Officer Training Corps Rochester leads 70 men and women (Midshipmen) to earn a college degree and a commission in the Navy or Marine Corps. We develop academic, moral, and physical excellence. Staff mentorship and fellow Midshipman camaraderie ease the transition to college and set a framework for future success.

Midshipmen normally take one naval science course per semester, starting with the two listed below. Additionally, a weekly lab period covers topics of interest to the military service: leadership seminars, speakers on cultural studies, and visits from officers serving in the fleet. Outside the classroom, activities include intramural sports and community service. In regional military drill and athletic competitions, we consistently place among the top three. An integral part of the University and community, Midshipmen participate in the full range of Rochester activities.

### Departmental Advice for First-Year Students

Our classes are available to any student interested in learning about military service, regardless of the intent to join. Some courses meet cluster requirements for graduation; check with your academic advisor for details. First- and second-year students interested in becoming officers in the Navy or Marine Corps are encouraged to explore the opportunities our program offers. Most scholarships are awarded in high school; however, students may affiliate on a non-scholarship basis through the “NROTC College Program” for additional opportunities to earn a commission and/or a scholarship.

## Courses

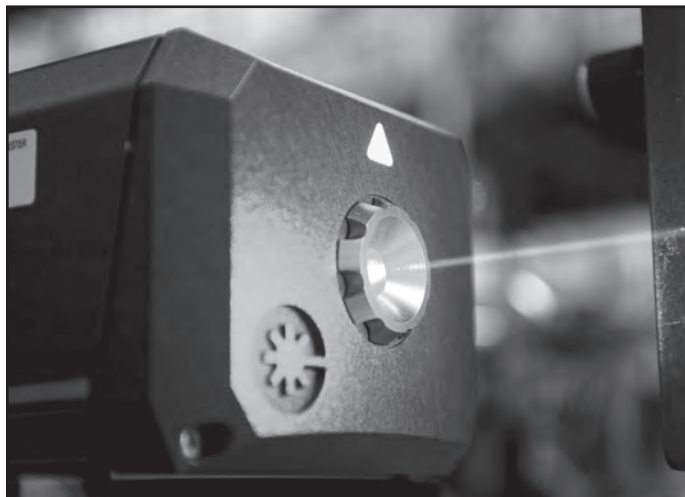
### First-Year Classes

**NAV 093 Introduction to Naval Science.** This course introduces students to life in the United States Navy and Marine Corps. Taught by a naval officer, course content covers military customs, courtesies, and traditions; rank structures; officer and enlisted relationships; and potential career paths. Individual research projects allow students to explore areas of interest. Active-duty guest speakers share their service experience. (Fall)

**NAV 250 Sea Power and Maritime Affairs.** This course focuses on the development of the US Navy and Marine Corps. As the country and the world have grown and changed, so too has our service. It examines how the history of the Navy fits in with, and has been shaped and influenced by, the history of the country and the world. The class also explores how changes in technology, strategy, politics, and personalities, along with the battles and wars fought, have made the Navy and Marine Corps what they are today. (Spring)

**For more information, go to [nav.rochester.edu/undergraduate/index.html](http://nav.rochester.edu/undergraduate/index.html).**

## THE INSTITUTE OF OPTICS



### Information about the Department

Optics and optical engineering deal with the generation, propagation, detection, manipulation, and application of light. The University of Rochester’s optics department, called the Institute of Optics, is one of the world’s leading centers for teaching and research in this dynamic field and has been for quite some time—it awarded the nation’s first BS degree in optics in 1932. Although very few high school students are aware of optics as a distinct discipline, the world’s need for optics experts is always growing. The birth of the laser in the early 1960s is only the most famous of the many advances in optics—including fiber-optic communications, holography, laser surgery, digital cameras, handheld displays, virtual reality environments, quantum computing, and energy-efficient lighting—that continue to change our world. Optics has become one of the technological pillars of modern society. Optical techniques also contribute much to modern science, figuring prominently in a number of recent Nobel prizes—including Nobel prizes in Physics given in 2018 for research done at the University of Rochester by an optics graduate student and her thesis advisor!

A degree from the Institute of Optics is a symbol of quality and distinction recognized throughout the world. The Institute’s optics/optical engineering curriculum (BS degrees are offered in both) provides the depth and breadth needed to prepare for a variety of career options. The required coursework includes classes in geometrical optics, interference and diffraction, advanced mathematical methods, electromagnetic theory, aberrations and testing, optical sources and detectors, and quantum theory as well as multiple laboratory classes and two semesters of computer-skill building. Students supplement their required coursework with technical electives to tailor the major to their specific interests. Senior year includes a yearlong capstone experience, either a senior thesis topic (typically research in a professor’s group) or a team-based design project including a customer and a faculty advisor.

The Hopkins Center for Optics Design and Engineering, located within the department and intended expressly for undergraduates, houses state-of-the-art tools for the design, fabrication, polishing, and testing of optical elements, giving our students unusually direct access to cutting-edge technology and industry-standard software. Many students also get involved as undergraduates in the world-class faculty research programs that are a distinctive part of the institute’s culture.

In addition, research opportunities are available for optics undergraduates at the Laboratory for Laser Energetics (LLE). The LLE features some of the most advanced lasers in the world, such as the Omega EP, which is capable of picosecond operations ([www.lle.rochester.edu/](http://www.lle.rochester.edu/)).

### Departmental Advice for First-Year Students

A first-year student entering optical science and engineering typically takes a basic science course (usually chemistry), mathematics, a writing or cluster course, and Introduction to Optics or another introductory engineering course. The second semester continues with mathematics, physics, a cluster or writing course, and a departmental introduction to scientific computing (Optics 211). The sophomore year contains more courses in math and physics, a cluster course each semester, and the first three core courses in optics: Geometrical Optics (OPT 241), Interference and Diffraction (OPT 261), and Mathematical Methods in Optics (OPT 287). The first two of those courses have accompanying 2-credit labs. The junior year program builds on this foundation and contains courses in electromagnetic theory, lens aberrations and testing, light sources and detectors, and the quantum theory of light. The senior year, drawing on previously completed academic study, features the student's senior research or design project. Several technical electives are also typically taken the senior year. In addition, select seniors may take graduate-level courses and apply earned credit toward a master's degree from the Institute of Optics. Consult with the undergraduate program manager (Wilmot Building, room 106) for more details.

*Please note: Any first-year student with a strong academic background in math and physics (e.g., AP credit) may, with instructor and advisor permission, directly enter OPT 241, Geometrical Optics.*

Rochester students completing the BS in optics or optical engineering in recent years have chosen to pursue graduate studies in optics, physics, electrical engineering, and biomedical engineering; to accept positions as optical engineers in the thriving regional and international optics industry; to work in engineering sales; and to enter business programs to pursue an MBA. As optical devices continue to be fabricated at ever smaller dimensions, portable and handheld optical devices (think smartphones and virtual/augmented-reality systems) now represent one of the most explosive areas of employment growth. Medicine and law also offer significant opportunities for someone with a background in optics. Optical instrumentation and techniques are increasingly important in medical research and medical practice, so a medical doctor (or an MD/PhD) with a BS in optics is uniquely educated to become a key participant in these emerging areas. Likewise, because of the strong entrepreneurial spirit of the optics community, a patent attorney with a BS in optics can establish a very active practice.

### Typical First-Year Program

#### Fall Semester

MTH 161  
CHM 137  
WRT 105 or cluster course  
OPT 101 Introduction to Optics

#### Spring Semester

MTH 162  
PHY 121  
WRT 105 or cluster course  
OPT 211 (MATLAB for optics majors)

## Courses

**OPT 101 Introduction to Optics.** This course introduces the field of optics—from ancient history to the future. Fundamental concepts such as refraction, diffraction, interference, and imaging are explored in a nonmathematical interdisciplinary approach. Each class includes vivid demonstrations that students can try out in the laboratory afterward. The importance of optics in other fields such as electrical, mechanical, biomedical, and chemical engineering, as well as physics and biology are explored and highlighted. Team projects and presentations give students in-depth appreciation of modern technologies ranging from DVD data storage to quantum encryption. We also discuss career paths and jobs in optics.

**OPT 211 Matlab for Optics Majors 1.** Teaches techniques of transforming continuous problems to discrete mathematical models. Students learn computational methods for solving problems in optics using Matlab, an example of high-level software that is widely used in the field of optics. Includes labs.

### Study Abroad Opportunities

We encourage our students to study abroad, typically during a semester of junior year. Many study abroad credits transfer to the optics curriculum, and instruction can be either in English or the language of the host country. Examples of study abroad program sites for optics include Australia, Israel, Sweden, Spain, and New Zealand.

### Co-Op and Internship Opportunities

The institute has partnered with multiple companies who are part of our Industrial Associates program. These companies offer summer internships and co-op opportunities specific to optics students. We encourage all students to take advantage of these unique opportunities.

**For more information, go to [hajim.rochester.edu/optics/](http://hajim.rochester.edu/optics/).**



## PHILOSOPHY



*“Philosophy is to be studied, not for the sake of any definite answers to its questions . . . but rather for the sake of the questions themselves; because these questions enlarge our conception of what is possible, enrich our intellectual imagination, and diminish the dogmatic assurance which closes the mind against speculation.”*

—Bertrand Russell

### Information about the Department/ Advice for First-Year Students

Philosophy addresses a wide range of questions in areas such as:

- **Metaphysics and Epistemology** (What is the fundamental nature of reality, and what is our place in it? What can we know, and how can we get that knowledge?)
- **Mind** (What is consciousness? How is it related to brain activity? Can we have free will?)
- **Science** (How do the sciences yield knowledge? How does scientific explanation work? What sets good science apart from bad science or pseudoscience?)
- **Logic** (What are the basic principles underlying good reasoning and argumentation?)
- **Ethics** (What is good, and how should we live? Are there objective moral standards?)
- **Politics** (What makes for a just society? What are the conditions for global justice?)
- **Religion** (Is there a supreme being? Is faith compatible with science and reason?)
- **Aesthetics** (e.g., What is beauty? What is art? Can aesthetic judgment be objective?)

The philosophy major requires 10 courses, including PHL 101, two core courses in the history of philosophy, one course in logic, and an undergraduate major seminar. Many philosophy majors are double majors. Concentrators wishing to emphasize a particular subfield of interest may make use of optional guidelines for ways of satisfying the major that emphasize either Law and Ethics, History

of Philosophy, or Logic and the Philosophy of Science. Majors who qualify may participate in the philosophy Honors program. (For more information about requirements and guidelines, see [sas.rochester.edu/phl/undergraduate/major.html](http://sas.rochester.edu/phl/undergraduate/major.html).)

The Department of Philosophy also offers four different minors: the general Philosophy Minor (PH); Ethics Minor in Philosophy (ET); History of Philosophy Minor (HP); and Philosophy of Science Minor (PS). There are also six clusters in philosophy: Ethics and Values (H1PHL001); History of Philosophy (H1PHL002); Knowledge, Mind, and Nature (H1PHL003); Philosophy and Law (H1PHL004); Philosophy and Teaching Internship (H1PHL005); and Logic (N1PHL001). All *except* the logic cluster are in the humanities; the logic cluster is in the natural sciences. Many introductory courses may be used as the first course in a cluster. For more information on our minors (each of which requires only five courses, meeting various conditions) and clusters, see [sas.rochester.edu/phl/undergraduate/minor.html](http://sas.rochester.edu/phl/undergraduate/minor.html).

Many philosophy majors go on to law school, where they find the analytic and critical skills emphasized in philosophy most useful. Others go on to medical school, business school, graduate school in other fields, or various professions. Some go on to do graduate work in philosophy. All students who wish to take a philosophy course, including those students who plan to major or minor in philosophy, should begin with any of the introductory courses listed below.

#### International Baccalaureate (IB)

Philosophy—Students who receive a higher-level exam score of 5 or better are awarded credit for PHL 101. No credit is granted for subsidiary-level exams.

### Courses

**PHL 101 Introduction to Philosophy.** A study of fundamental philosophical problems relating to such things as perception and reality, personal identity, freedom and responsibility, morality, knowledge and skepticism. (Fall and Spring)

**PHL 102 Ethics.** A critical examination of leading theories of right and wrong, good and bad, and more generally the functions of ethical language and the possibility of moral knowledge. (Fall and Spring)

**PHL 103 Moral Problems.** A critical exploration of ethical theory and its application to moral problems, such as global poverty, euthanasia, stem cell research, abortion, socioeconomic inequality, capital punishment, torture, and the treatment of animals. (Fall and Spring)

**PHL 105 Reason and Argument.** A study of reason and argument, evaluating reasoning as it is found in editorials, speeches, essays, and reports on scientific research. (Fall)

**PHL 110 Introductory Logic.** Symbolic logic through first-order quantification theory. Skill in deductive inference is developed through construction of proofs and other methods of a rigorously defined artificial language. (Fall and Spring)

**PHL 111 Philosophy of Religion.** (Cross-listed with REL 111) Historical and recent readings are used to analyze issues such as the existence of God, divine attributes, the relation of God to the world, and the relation of faith and reason. (Fall)

**PHL 114 Philosophy and Science Fiction.** In this course, we discuss science fiction that raises philosophical problems—about personal identity, time, free will, etc.—and investigate these problems. (Fall)

**PHL 120 Engineering Ethics.** Case-based exploration of principled decision making, communication, and professional flourishing in engineering, focusing on values integral to the design process and ways in which institutional settings influence decision making. (Fall)

**PHL 135 Environmental Ethics.** An examination of central concepts and issues in environmental ethics, including the nature of and responsibility for current environmental crises; the responsibilities of individuals, institutions, and nations; the importance of sustainability; and the ultimate principles and values at stake. (Spring)

**PHL 152 Science and Reason.** The nature of science and its relationship to religion: Are there criteria that distinguish science from non-science? Is there such a thing as the scientific method? Has knowledge advanced steadily through the history of science? What role do values play in science? Do science and religion conflict? Is intelligent design science? (Spring)

**PHL 171 Philosophical Foundations of Feminism.** The investigation of some of the philosophical issues raised by contemporary feminism, such as questions about justice, human nature, and human freedom. Same as WST 205. (Spring)

For more information, go to [sas.rochester.edu/phl/](http://sas.rochester.edu/phl/).

## PHYSICS AND ASTRONOMY



*“The eternal mystery of the world is its comprehensibility.”*

—Albert Einstein

### Information about the Department

The Department of Physics and Astronomy is dedicated to providing an environment that gives flexibility and customized study plans in which all undergraduate students have the resources they need to succeed. The research interests of the department are very broad, covering condensed-matter physics, nuclear and particle physics, biological physics, plasma physics, mathematical physics, quantum

optics, atomic and molecular physics, astrophysics, and infrared astronomy. Research colloquia and seminars are offered every week during the academic year and are open to undergraduates.

We offer special programs for undergraduate students, such as the Research Experience for Undergraduates (REU), the Rochester Symposium for Undergraduate Physics Students (RSPS), and the Teaching Internship Program. In addition, the department supports a students' section of the American Institute of Physics, serving the interests of undergraduate and graduate students. Undergraduate students are encouraged to engage in research activities at research laboratories on and off campus. There are opportunities for learning data analysis using the excellent computer facilities of the department. More information is available in the Physics and Astronomy Undergraduate Handbook available from our undergraduate office (Room 211 Bausch & Lomb Hall) and on our website at [www.pas.rochester.edu](http://www.pas.rochester.edu).

### General Advice

The Department of Physics and Astronomy offers programs leading to the BA or BS in physics; the BA or BS in physics and astronomy; minors in either physics or astronomy; and certificates in biological physics, medical physics, or biological and medical physics.

The BA program in physics is designed for those students interested in physics in conjunction with another area of human endeavor (law, environmental sciences, energy policy, medicine, business, engineering, education, etc.). It lends itself to a double major with other departments.

The BS program in physics provides a thorough preparation for graduate work in physics or astrophysics and is appropriate for students with career interests in teaching and research. The curriculum stresses the fundamentals: classical mechanics, electromagnetism, thermal and statistical physics, quantum mechanics, modern laboratory practices, and introductions to nuclear and particle physics, solid state physics, biological physics, astrophysics, and astronomical techniques. Students are encouraged to present a senior thesis and to participate in research opportunities provided by the department's research groups. Typically, about 30 undergraduates per year participate in summer and academic-year research. The department is the site of an NSF-funded Research Experience for Undergraduates (REU) program.

The BA and BS programs in physics and astronomy require, in addition to many of the same courses required for the degree programs in physics, up to two introductory and up to three upper-level courses in astronomy. The BA program is designed for those students not expecting to pursue careers in astrophysics. The BS program is designed primarily for students interested in entering graduate programs in physics or astrophysics.

### Departmental Advice for First-Year Students

Students with interests in science, mathematics, or engineering who have taken physics in high school are encouraged to begin their introductory study with PHY 141 (honors) in the fall semester. They will continue with PHY 143 (honors) in the spring semester and PHY 142 (honors) in the fall semester of their sophomore year. Students without previous experience in calculus and/or physics are advised to delay their first physics course until the spring semester, when PHY 121 is offered. Students who do well in PHY 121 and wish to pursue introductory physics in greater depth can then

switch to PHY 142 (honors) in the fall semester of their sophomore year. The regular continuation of PHY 121, PHY 122–123, is also suitable for physics and engineering students. PHY 113–114 is a calculus-based two-semester course sequence appropriate for majors in the biological and life sciences. For other majors requiring a less intense introduction to physics or astronomy, PHY 100, 102, 103 and AST 102, 104, 105, 106 are courses for nonscientists and are often used for the physics or the physics and astronomy cluster programs.

Students enrolled in PHY 121 or PHY 141 should register concurrently for MTH 161 (Calculus I). Students with AP credit for MTH 161 may want to brush up on mathematical skills using books such as *Preparing for General Physics, Math Skill Drills* by Arnold D. Pickar (Addison Wesley).

All physics and astronomy majors should start with the same recommended physics sequences as physics majors (see above). In addition, first-year students are encouraged to take AST 111 in the fall semester.

#### Advanced Placement (AP)

- **5 on test C-I (Mechanics)**

Credit granted for PHY 113 or PHY 121, and students can be placed into PHY 114, PHY 122 or PHY 142\*.

- **5 on test C-II (Electromagnetism)**

Credit for PHY 114, conditional credit† for PHY 122, and students can be placed into PHY 123 or PHY 143\*.

- **5 on test B (General)**

Conditional credit† granted for PHY 113 or PHY 121. Can be placed into PHY 114 or PHY 122.

- **5 on Physics I (Mechanics)**

Four general college hour credits; these credits cannot be used to satisfy any of the requirements for the PHY/PAS major or minor.

- **5 on Physics II (Electromagnetism)**

Four general college hour credits; these credits cannot be used to satisfy any of the requirements for the PHY/PAS major or minor.

- **4 on test C-I (Mechanics)**

Conditional credit† granted for PHY 113 or PHY 121. Can be placed into PHY 114, PHY 122 or PHY 142.

- **4 on test C-II (Electromagnetism)**

Conditional credit† granted for PHY 122. Can be placed into PHY 123 or PHY 143\*.

#### International Baccalaureate (IB)

Physics—Students who receive a higher-level exam score of 7 are placed into PHY 114 or PHY 122. Additionally, they are awarded credit for PHY 113 or PHY 121 after completion of PHY 114 or PHY 122 with a grade of B– or better.

#### Clusters

Courses from the Department of Physics and Astronomy appear in seven approved clusters. The clusters involve three-course sequences and include Science: Discovery, History, and Methodology; An Introduction to the Physical World; Quantitative Physics; Honors Physics; The Nature of the Universe; Science and Technology by Inquiry; and Physics in Seafaring.

#### Physics Courses

**PHY 099 Introduction to Math Methods for Scientists and Engineers.** (formerly PHY 101) A review of basic problem-solving techniques in precalculus mathematics (algebra, geometry, trigonometry) in the forms usually found in the equations of science and engineering. Prerequisite for PHY 121/PHY 121P and PHY 122/122P. Credit can be gained by passing the Basic Math Assessment Exam offered in the first week of the semester. (Fall semester, P/F only) (0 credit)

**PHY 121 Mechanics/ PHY 121P Mechanics.** (*Mastery/Self-paced*). First semester of a three-course sequence for students planning to major in physics, other physical sciences, and engineering. Motion in one and two dimensions; Newton's laws; work and energy; conservation of energy; systems of particles; rotations; oscillations; gravity; thermodynamics. In addition to two 75-minute lectures each week, one workshop each week and one three-hour laboratory every other week are required. Laboratory and workshop registration is done at the same time as the course registration. PHY 121P Mechanics (Mastery/Self-paced) covers the same material as PHY 121 and runs in parallel with that course but operates as a self-paced, mastery-learning course, unlike the traditional, lecture/recitation-based PHY 121. Prerequisites: PHY 099 (formerly PHY 101) and MTH 162 (may be taken concurrently). EAS 101, 102, 103, 104, or 105 can be accepted in place of PHY 099. (Spring and Summer I)

**PHY 122 Electricity and Magnetism/PHY 122P Electricity and Magnetism.** (*Mastery/Self-paced*) Second semester of a three-course sequence for students planning to major in physics, other physical sciences, or engineering. Coulomb's law through Maxwell's equations; electrostatics, electrical potential; capacitors; electric fields in matter; current and circuits; magnetostatics; magnetic fields in matter; induction, A.C. circuits; electromagnetic waves. In addition to two 75-minute lectures each week, one workshop each week and one three-hour laboratory every other week are required. Laboratory and workshop registration is done at the same time as course registration. PHY 122P Electricity and Magnetism (Mastery/Self-paced) covers the same material as PHY 122 and runs in parallel with that course but operates as a self-paced, mastery-learning course, unlike the traditional, lecture/recitation-based PHY 122. Prerequisites: PHY 099 (formerly PHY 101), PHY 121, MTH 162, or PHY 113 and MTH 143 (or its equivalent). EAS 101, 102, 103, 104, or 105 can be accepted in place of PHY 099. (Fall and Summer II)

**PHY 141 Mechanics.** (*Honors*) First semester of a three-course honors sequence, recommended for prospective departmental majors and other science or engineering students with an interest in physics and mathematics who have taken physics in high school. Topics are similar to those in PHY 121 but are covered in greater depth. These include symmetries, vectors, coordinate and velocity transformations, motion in one and two dimensions, Newton's laws, work and energy, conservation of energy and momentum, special relativity, systems of particles, gravity and Kepler's laws, rotations,

\* Placement into honors-sequence courses PHY 142 and 143 requires permission of the instructor. Students desiring greater benefits than offered above should appeal to the program coordinator for Undergraduate Studies (211 Bausch & Lomb).

† "Conditional credit" means that credit will be granted if the student receives a grade of "B–" or better in the course into which he or she is placed.



oscillations, molecular theory, and thermodynamics. In addition to two 75-minute lectures each week, one workshop/recitation each week and one three-hour laboratory every other week are required. Laboratory and workshop registration are done at the same time as course registration. Prerequisite: MTH 161 (may be taken concurrently). (Fall)

**PHY 143 Waves and Modern Physics.** (*Honors*) Second semester of a three-course honors sequence, recommended for prospective departmental concentrators and other science or engineering students with a strong interest in physics or mathematics. Topics are the same as PHY 123 but are covered in greater depth. Introductory examinations of Bohr’s atomic model; Broglie waves; momentum and energy quantization; Heisenberg’s uncertainty relation; Schrodinger’s cat; electron spin; photon interference; and Bell’s inequalities; selected applications to solid-state, nuclear, particle, and astrophysics. In addition to two 75-minute lectures each week, one workshop each week and one three-hour laboratory every other week are required. The laboratory and workshop registration are at the same time as the course registration. Prerequisites: PHY 141 or permission of the instructor; MTH 162 (may be taken concurrently). (Spring)

*Astronomy Courses*

**AST 102 Relativity, Black Holes, and the Big Bang.** A physical and astronomical (but non-mathematical) picture of the workings of Einstein’s theories of relativity and their application to cosmology and to black holes and wormholes, the most exotic and energetic objects known to scientists. Our aims in this course are two: 1) to demystify black holes, big-bang cosmology, and the nature of space and time for non-science majors in order that they may evaluate critically the frequent references to these esoteric concepts in the press and in popular science and science-fiction literature; and 2) to provide non-science majors with a glimpse of the processes by which scientific theories are conceived and advanced. Prerequisites: none. (Fall or Spring)

**AST 106 Cosmic Origins of Life.** A review of the evidence for habitats and the building blocks of life in extraterrestrial space, the possibilities for the development of life elsewhere, and the light that these ideas cast on the origins of life on Earth. We also discuss the future of civilizations like ours, the possibilities of travel to other habitable planets, and communication between advanced cultures spread widely through space. The material we discuss is drawn very widely from astronomy, physics, geology, chemistry, and biology, presented with a minimum of mathematical complexity. Prerequisites: none. (Fall or Spring)

**AST 111 The Solar System and Its Origin.** A study of the structure and composition of the individual planets and smaller solar-system bodies, the orbital dynamics and overall structure of the solar system and its contents, and the formation of planetary systems like ours. Designed for first-year students who intend to major in science or engineering, the course involves the use of ideas learned in mathematics and physics courses taken concurrently or in high school, such as single-variable calculus, Newton’s laws of motion and gravity, and the ideal-gas law. The course also includes a nighttime observing project taking CCD images of planets and their satellites using the Mees Observatory 24-inch telescope. Prerequisite: MTH 161 or 171 (may be taken concurrently) (Fall)

**AST 142 Elementary Astrophysics.** Application of the physics and math techniques learned in the introductory course sequences to the study of celestial objects outside the solar system. We discuss stars and their formation from interstellar matter, the structure of galaxies and their distribution in the universe, and the origins and large-scale structure of the universe: all topics that are developed much further in the AST 200-level courses. The course also includes a nighttime observing project based upon student use of professional-style telescopes and CCD cameras. Registration for recitation is required at the time of course registration. Prerequisites: PHY 141–143 or PHY 121–123 (or concurrent enrollment); MTH 161–165 or MTH 171–174 (or concurrent enrollment), or permission of instructor; AST 111 recommended but not required. (Spring)

*For more information, go to [pas.rochester.edu](http://pas.rochester.edu).*

**POLITICAL SCIENCE AND INTERNATIONAL RELATIONS**



*“What is government itself but the greatest of all reflections on human nature? If men were angels, no government would be necessary.”*

—James Madison  
*The Federalist No. 51*

**Information about the Department**

Tariffs, immigration, Brexit, Black Lives Matter, #metoo, the Supreme Court, partisan polarization, democratic erosion, authoritarianism, war, diplomacy: politics is all around us in 2019. Political science is the attempt to discover, describe, and explain how politics manifests itself in the world. Our subject matter emerges from numerous contexts, including U.S. local, state, and national politics; the politics of other nations; and international relations. It also arises from more abstract, philosophical concerns. We attempt to create knowledge by the development and use of rigorous theory and the drive to generalize and by rigorous empirical testing through sophisticated, theory-relevant statistical and qualitative methods.

In Rochester’s Department of Political Science, we teach students how to understand real-world politics and give them the tools

to think, question, and act. Our graduates pursue an array of careers, including teaching, medicine, and research, but most graduates find that political science gives them a background that is especially useful for careers in law, government, policy analysis, business, or journalism.

The department offers majors, minors, and clusters in political science and in international relations. The department's website contains detailed information on undergraduate advising, course offerings, distribution requirements, upper-level writing requirements, internships, and departmental honors. We also have faculty advisors available to answer questions nearly every weekday morning and afternoon during the academic year. Names and office hours of advisors are on the department website. Students may find our website at [www.sas.rochester.edu/psc/](http://www.sas.rochester.edu/psc/).

### Departmental Advice for First-Year Students

The department offers a number of introductory courses at the 100 level that are especially suited for first-year students. These courses are described briefly below. PSC 200 (Data Analysis I) is also appropriate for first-year students.

We recommend that students interested in political science take at least two of these courses (IR/PSC 101, IR/PSC 102, PSC 105, IR/PSC 106, PSC 107, PSC 200) in their first year. Many other 200-level courses are open to first-year students and may be suitable for students who have performed very well on an AP or IB exam in American politics or comparative government or who have an excellent background in high school courses in history and government and a strong interest in political science or international relations. However, even these students generally take 100-level courses or PSC 200 (Data Analysis I), at least in their first semester of college. First-year students who have questions about any particular course should speak either to a departmental advisor or directly to the course instructor at the beginning of the semester.

We strongly recommend that students interested in international relations take at least two of these courses: IR/PSC 101, IR/PSC 102, IR/PSC 106, PSC 107, PSC 200 in their first year. Students might also look for other courses, including 100-level courses that count toward one of the specialized tracks and 200-level courses open to first-year students. Students are also advised to begin or continue courses in a foreign language. Not only does this help meet the requirements, but it also allows the student to consider opportunities for study abroad that require proficiency in a language other than English.

### Advanced Placement (AP) Political Science

Students who received a score of 4 or 5 on the AP exam in either American or Comparative Government will be granted 4 credits in political science. Students who received a score of 4 or 5 on both AP exams are not eligible for additional credit.

### Advanced Placement (AP) International Relations

Students who received a score of 4 or 5 on the AP exam in American or Comparative Government or a score of 5 in U.S., European, or World History will be granted credit for one course toward the international relations major. Students who received a score of 4 or 5 on multiple AP exams are not eligible for additional credit.

## Courses

**IR 101/PSC 101 Introduction to Comparative Politics.** This course is an introduction to the study of domestic political institutions, processes, and outcomes across and within countries. The course surveys key concepts and major theoretical contributions in the field of comparative politics, including the challenges for democratization and democratic consolidation; the possibility of revolution; how countries vary in their political and electoral institutions and why these variations matter; and the power of social forces such as ethnicity, culture, and social capital. Country cases are drawn from different regions of the world and historical periods to ground students in the set of tools of comparative analysis. (Fall)

**IR 102/PSC 102 Introduction to International Political Economy.** All politics is global politics. Global flows of trade, capital, and labor transform societies, unleash new political movements, and challenge existing political institutions. States and other actors respond in ways that impose costs on other states, creating crises and opportunities for cooperation. This course broadly surveys the politics of international economics, focusing in particular on trade and finance. Along the way, it introduces students to a range of economic models, but it will assume no prior exposure to economics. (Spring)

**PSC 105 Introduction to American Politics.** This course introduces students to the systematic study of American political institutions, processes, and behavior. We focus on key questions about the political system and how political scientists address these questions. The strategic actions and interactions of various political actors are examined from a variety of theoretical and empirical approaches. Political polarization, economic inequality, presidential power, and the role of the administrative state are discussed throughout the course. (Spring)

**IR 106/PSC 106 Introduction to International Relations.** This course provides students with the background and conceptual tools they need to understand contemporary international relations. The course introduces students to the wide range of issues that make up the study of international relations, including the workings of the state system, the causes of international conflict and violence, and international economic relations. Students are introduced to the literature in a broad way to make them familiar with the main theoretical traditions in the field. Time permitting, we also examine topics of particular current interest, such as the evolving nature of power in the post-Cold War environment as well as special global challenges like nation-building and the proliferation of weapons of mass destruction. (Fall)

**PSC 107 Introduction to Positive Political Theory.** This course introduces students to positive political theory, a rigorous set of tools that helps clarify key questions in political science. Through examples drawn from all aspects of the political process (from elections to lawmaking to regulation) as well as from everyday life (where should we go for dinner?) and Hollywood (Russell Crowe and Reese Witherspoon as political scientists?), we study how the rules of the game affect the decisions politicians make as well as the policy outcomes we observe. (Fall)

**PSC 200 Data Analysis I.** Data analysis has become a key part of many fields, including politics, business, law, and public policy. This

course covers the fundamentals of data analysis, giving students the necessary statistical skills to understand and critically analyze contemporary political, legal, and policy puzzles. Lectures focus on the theory and practice of quantitative analysis, and lab sessions guide students through the particulars of statistical software. No prior knowledge of statistics or data analysis is required. Without special permission of the instructor, students may not enroll in this course if they have earned credit and a letter grade for ECO 230, PSC 205, PSY/CSP 211, STT 211, STT 212, STT 213, STT 214, or any other course in statistics, or if they have received a score of 4 or 5 on the Advanced Placement exam in Statistics. (Fall and Spring)

**For more information, go to [sas.rochester.edu/psc/](http://sas.rochester.edu/psc/).**

## PSYCHOLOGY



*“... the mind which the psychologist studies is the mind of distinct individuals inhabiting definite portions of real space and of a real time.”*

—William James

### Information about the Program/Advice for First-Year Students

Psychology, as a science of behavior and mental life, uses the methods of science to seek answers, develop theories, and explore applications across a broad range of areas, including social factors; learning and memory; motivation; biological factors; development; cognition and language; sensation and perception; movement and action; organizations; and psychopathology. Instruction is offered throughout this broad spectrum of behavior and mental life issues, treating both the natural science and social science aspects of psychology. Coursework includes theoretical and empirical emphases, as well as the application of psychology to human services professions. Student experiences may range from lecture courses, many with small recitations, to individual laboratory, practicum, and internship opportunities. Individual programs, including a major, minors, an honors program, and several clusters, may be tailored to provide excellent background for postgraduate work in psychology, medicine, education, business, social work, counseling, and other related social and natural sciences, as well as entry into various occupations, particularly those involving delivery of human services.

Students planning to pursue graduate studies in psychology are advised to seek general breadth and focused depth in their knowledge of psychology as well as a working familiarity with research skills.

**Advanced Placement (AP) and International Baccalaureate (IB)** PSY 101, Introduction to Psychology, is waived as a prerequisite for the major and the minors in psychology for students who receive a score of 4 or higher on the AP Psychology examination or a 5 or higher on the higher-level IB examination. A score of 4 or 5 on the AP examination or of 6 or higher on the higher-level IB examination will earn college credit for PSY 101. There is also a placement examination offered during Orientation and at other times by the College Center for Advising Services. Any PSY 101 prerequisites are waived upon passage of this exam.

#### Clusters

The Department of Clinical and Social Sciences in Psychology offers social science clusters and administers the program in psychology. The social science clusters in psychology cover a range of areas in clinical and social sciences in psychology, including psychology as a social science, psychopathology, motivation, social psychology, organizational psychology, personality, and social/emotional development.

#### Courses

The Department of Clinical and Social Sciences in Psychology and the Department of Brain and Cognitive Sciences offer courses in psychology. The latter department also offers its own programs that are described elsewhere in this handbook.

All of the following courses are included in various clusters in Clinical and Social Sciences in Psychology (social sciences) or Brain and Cognitive Sciences (natural sciences).

**PSY 101 Introduction to Psychology.** One fall section is exclusively for first-year students and has special features that enhance the first semester here. Additional sections of PSY 101 are offered during fall and spring semesters. PSY 101 is an excellent entry point for all future directions in psychology. It is a prerequisite to the major and minors and an entry point for the cluster Psychology as a Social Science, and it provides a broad background upon which to base a choice of more specialized clusters. (Fall and Spring)

*Note: The following are courses in psychology programs that are available with advice to first-year students. Although PSY 101 is not a formal prerequisite for the higher-numbered courses listed below, it is strongly recommended as both substantial and contextual background.*

**PSY 110 Neural Foundations of Behavior.** Introduces the structure and organization of the brain and its role in perception, movement, thinking, and other behavior. Topics include the brain as a special kind of computer, localization of function, effects of brain damage and disorders, differences between human and animal brains, sex differences, perception and control of movement, sleep, regulation of body states and emotions, and development and aging. (Fall and Spring)



**PSY 111 Foundations of Cognitive Science.** Introduces the organization of mental processes underlying cognition and behavior. Topics include perception, language, learning, memory, and intelligence. This course integrates knowledge of cognition generated from the field of cognitive psychology with findings from artificial intelligence and cognitive neuroscience. (Fall and Spring)

**PSY 161 Social Psychology and Individual Differences.** An introduction to the field of social psychology and an overview of research on individual differences in personality. Topics include the self, attributions, social cognition, interpersonal attraction, relationships, helping, social influence, traits, and motive dispositions. Students complete and receive personal feedback on a number of personality measures. (Spring)

**PSY 171 Social and Emotional Development.** An examination of the interpersonal, emotional, cognitive, and environmental factors that influence children's social and emotional development from early infancy through late adolescence. (Fall)

**PSY 181 Theories of Personality and Psychotherapy.** A survey of psychodynamic, existential, and empirical approaches to personality and psychotherapy. The content of this course is best understood to the extent that students actively wrestle with and apply the material to their own experience; as a result, this course is designed as a "hybrid" course that combines online learning with traditional face-to-face learning in the form of small-group discussions. (Fall)

**PSY 219 Research Methods in Psychology.** An introduction to basic concepts, logic, and procedures needed to do psychological research. Hands-on experience with all major phases of the research process is provided, including surveying the existing literature, developing research hypotheses, collecting and analyzing data, and reporting the results in manuscript form. (Fall and Spring)

**PSY 232 Psychology of Consumerism.** Examines the psychology behind product placement, marketing of products, brand identity, and advertising to consumers. (Spring)

**PSY 262 An Approach to Human Motivation.** This course provides a review of the theoretical and empirical development of a contemporary approach to human motivation, namely, Self-Determination Theory, which originated at the University of Rochester and is currently researched by scholars around the world. Topics also include applications of Self-Determination Theory to such domains as psychopathology and psychological health, work, education, sport, and culture. (Spring)

**PSY 263 Relationship Process and Emotions.** This course examines psychological research on such important topics as attachment, emotion, intimacy, conflict resolution, relationship differences and similarities, and the impact of relationships on physical health and emotional well-being (as well as other topics that may arise). (Fall)

**PSY 264 Industrial and Organizational Psychology.** Applications of psychological theory and research to work settings. Topics include personnel selection, training and appraisal; organizational structure and transformation; performance in work groups; motivation and satisfaction; leadership; work conditions; and cross-cultural issues. (Spring)

**PSY 267 Psychology of Gender.** Exploration of the ways males and females differ in interaction, theories of development of sex differences, and consequences for social change. (Fall)

**PSY 276 Psychology of Parenting.** Parenting and family life are emphasized from developmental, ecological, and cross-cultural perspectives. Caregiving in diverse family forms and cultures is studied in relation to adult-child interactions, parent/school/community relations, family roles, laws, and parenting skills. Issues related to aspects of diversity in contemporary families are included. (Spring)

**PSY 278 Adolescent Development.** This course surveys theory and research relating to normal development during adolescence. Adolescent development is examined in a variety of contexts, including families, peer groups, and schools; issues pertaining to biological, social, and cognitive development are discussed. (Spring)

**PSY 280 Clinical Psychology.** An introduction to the field of clinical psychology. Students are exposed to prevalent theoretical and research models as well as approaches and research findings to assessment, diagnosis, and treatment modalities. (Fall)

**PSY 282 Abnormal Psychology.** This course provides a conceptual overview to the field of psychopathology. We discuss assessment and diagnosis, etiology, developmental course, treatment, and prognosis of the major psychological disorders. Current theory and research are emphasized. (Spring)

**PSY 283 Behavioral Medicine.** An overview of the application of behavior/lifestyle change approaches to the treatment of medical disorders and the examination of interfaces between behavior and physiology. Topics include diabetes, cardiovascular risk factors, chronic pain, and cancer. (Spring)

*For more information, go to [sas.rochester.edu/psy/index.html](http://sas.rochester.edu/psy/index.html).*

## PUBLIC HEALTH–RELATED PROGRAMS

(MULTIDISCIPLINARY STUDIES CENTER)



*Health care is vital to all of us some of the time, but public health is vital to all of us all of the time.*

—C. Everett Koop

### Information about the Program

The study of public health provides a rich intellectual framework for the multidisciplinary study of society's most challenging problems. The program is designed to help students develop the many different skills that are needed to understand and respond to health challenges that arise in local, regional, and global populations.

The program offers both BA and BS degrees. The program offers BA degrees in bioethics; in epidemiology; in health policy; and in health, behavior, and society. The BS is intended for students who want to specialize in environmental health. The program also offers four minors and six clusters. (Students may choose to major, minor, or complete a cluster within the program, but they may not do more than one).

#### Program Advice for First-Year Students

The study of public health integrates a wide range of disciplines: it requires, for example, the ability to use and understand statistics, to understand how human and environmental factors contribute to human exposure to environmental toxins and pathogens, to empathize with people from different backgrounds and cultures, to understand social institutions that structure health care, and to analyze complex ethical situations. For that reason, all of the public health programs require a set of core competencies in a variety of disciplines, and each of the majors incorporates courses from many different departments to support its intellectual goals. Indeed, the majors fall into different divisions of the College: epidemiology; health policy; and health, behavior, and society (and their associated minors) are in the social sciences division; bioethics (and its minor) is in the humanities; and environmental health is in the natural sciences. We also offer clusters in natural sciences (Epidemiology and Statistics), social sciences (Introduction to Public Health; Health, Environment, and Sustainability; Health Policy; Medicine in Context), and humanities (Bioethics).

A public health–related major or minor is an ideal way to explore an interest in the health professions of medicine, dentistry, and nursing. To integrate fully an interest in public health with admissions requirements for professional schools, students are strongly encouraged to meet with a health professions advisor in the Gwen M. Greene Career and Internship Center.

All the public health majors require the same core of five courses, so those courses are an excellent place to explore the majors: PH 101, PH 102, PH 103, STT 211 or 212, and PHL 225 or 228. Many of these courses are also required to complete a minor or cluster. But students can also learn about the basic themes of the majors in the other courses listed below.

### Courses

**PH 101 Introduction to Public Health I.** This is a broad survey course designed to introduce beginning students to public health history, concepts, and contemporary issues locally, nationally, and globally. The course is divided into four sections: What is Public Health (history and definitions); Public Health Disparities (health and wealth; social justice; who gets sick/who stays healthy); Issues in Public Health (lead poisoning; tobacco; obesity; emergency; clean water/air; injury; health systems/reform); and Global Health Issues (globalization and development; maternal and child health). (Fall and Spring)

**PH 102 Introduction to Public Health II.** This is a broad survey course designed to introduce beginning students to four core areas in public health: biostatistics, health policy and management, environmental health science, and social and behavioral sciences. Each of these areas is addressed by experts in the field. Prerequisite: PH 101. (Spring)

**PH 103 Concepts of Epidemiology.** This course provides beginning students with the fundamental concepts needed to understand health-related information and health policy. The course introduces students to the history of epidemiology and the basic methodological principles used to describe disease occurrence in populations and identify causes of disease. These concepts are subsequently discussed in the context of health policy, outbreak investigations, and epidemiological specialties. (Fall)

**PH 116 Introduction to the U.S. Health System.** This course examines the organization, financing, and functioning of the United States health care system. It also explores historical perspectives and the insights of international comparisons. Topics include the economics of the U.S. health system, access to care, health policy and politics, and disability and disability politics. (Fall)

**PH 201 Environmental Health.** This course covers the basic principles used to evaluate the potential human health risk of exposure to environmental contaminants in air, water, and food. Prerequisites: PH 103, BIO 110/112, CHM 131, or permission of instructor. (Spring)

**STT 211 Applied Statistics for the Social Sciences I.** Descriptive statistics, statistical analysis, and statistical inference as used in the social sciences, including elements of correlation, regression, and analysis of variance. (Public health students may take either STT 211 or STT 212; degree credit is awarded for only one.) (Fall and Spring)

**STT 212 Applied Statistics for the Biological and Physical Sciences I.** Descriptive statistics, statistical analysis, and statistical inference as used in the biological and physical sciences; including elements of correlation, regression, and analysis of variance. (Public health students may take either STT 211 or STT 212; degree credit is awarded for only one.) (Fall and Spring)

*Students interested in the bioethics program may also wish to consider the following course:*

**PHL 103 Contemporary Moral Problems.** An introduction to moral philosophy as applied to current topics. Some questions to be explored: Is torture morally permissible in the fight against terrorism? Is it okay to destroy embryos for stem cell research? Can abortion sometimes be justified? How? Is active euthanasia ever permissible? Is capital punishment justifiable in principle? In practice? How far does our moral duty to aid distant strangers extend? What sorts of political and socioeconomic principles are morally justifiable? Do animals have moral rights? How should we understand the meaning and value of life and death? We also explore related general questions: Is it always possible for a good enough end to justify bad means? What is the relation, if any, between morality and religion? Are there objective facts about right or wrong, or is morality ultimately subjective or relative to cultures or times? Are there situations in which every available action is wrong? (Fall and Spring)

*For more information, go to [sas.rochester.edu/ph/](http://sas.rochester.edu/ph/).*

## RELIGION



*“Not by one road is it possible to arrive at so great a mystery.”*

—Symmachus

*“If I went back to college today, I think I would probably major in comparative religion, because that’s how integrated it is in everything that we are working on and deciding and thinking about in life today.”*

—John Kerry, former U.S. Secretary of State

## Information about the Department

Religion is a major force in the world, both in the past and in the present. It plays a key role in shaping the lives of individuals as well as societies and cultures as a whole. Religion has been and can be a

source of peace and compassion or an impetus for division and war. Students of religion learn to employ a variety of theoretical methods and interpretive approaches in order to understand religion in the diverse forms it has taken in different cultures and historical periods. The concentration in religion focuses on the study of the world’s major religions through analyses of their histories, texts, rituals, institutions, and practices that are embedded in complex cultures, societies, and political systems. Students can also take courses in which some aspect of religion, such as ritual, pilgrimage, mysticism, or myth, is studied thematically and comparatively.

Additionally, the department offers a wide range of courses that explore the many ways in which religious ideas and practices intersect with other aspects of human culture and society. For example, the department offers courses that examine the intersection of religion and different genres of music such as hip-hop or blues. Other courses explore the ways in which religion has influenced the law and shaped societal understandings of guilt and punishment. Still others focus the ways in which different religious traditions have shaped human understandings of the nature of the body and the self and have informed everyday bodily practices related to eating, dressing, and sexuality. Finally, in other courses, students grapple with the ways in which religions have provided the framework for understanding fundamental and perennial questions about the meaning of life, how to understand evil and suffering in the world, and what do we mean by “the good.”

Students have considerable independence in shaping and structuring their major so that they can focus on those areas of the study of religion that are of greatest interest to them while also developing a strong foundation in the study of religion generally and a mastery of the methods and theories used by scholars to understand religion in all its fascinating complexity.

Students in the Department of Religion and Classics are encouraged to do independent research, both in their classes and during the summer. Over the past 10 years, many students in the department have presented their research at the University of Rochester Research Exposition as well as at national conferences and have been awarded significant prizes in recognition of their work. Recent graduates of the program in religion have an excellent record of admission to top-tier graduate schools as well as to medical schools and law schools.

The program in religion is housed in the Department of Religion and Classics, which also offers a major in Classics as well as minors in Arabic, Hebrew, Turkish, Classics, Classical Civilizations, Latin, and Greek.

### Departmental Advice for First-Year Students

We want students to take courses that interest them, and, thus, there are no prerequisite courses that first-year students need to take in the religion concentration before moving on to a course that fits their interests. First-year students, however, are encouraged to begin with a 100-level course. Many students initially take a course in religion in order to fulfill their cluster requirement in the humanities and then go on to declare a minor or major in religion or in classics. First-year students are encouraged to contact the director of undergraduate studies, Anne Merideth ([anne.merideth@rochester.edu](mailto:anne.merideth@rochester.edu)), with any questions.



## Courses

All the courses listed below may be used as part of a major, minor, or cluster in the humanities. The Department of Religion and Classics offers many popular clusters, such as East Meets West, Religion and Society, Religion in America, Christianity, Buddhism, Judaism, Hinduism, Islam, Classical Civilization, Latin, Greek, Hebrew, and Arabic. The list below is only a small selection of courses available. Please consult [cdcs.ur.rochester.edu](http://cdcs.ur.rochester.edu) for a complete list of offerings in the Department of Religion.

### Fall Semester

**REL 101 Introduction to the Old Testament.** Examination of the texts of the Hebrew Bible (Old Testament for Christians) in their religious, historical, and literary contexts. Students learn the history of the ancient Israelite people from their origins down through the post-Exilic period. Study of the texts of the Hebrew Bible (Old Testament) enable us to explore what we can know about ancient Israelite society and culture, the rise and fall of Israel as a nation-state, religious and theological debates about the role of God in shaping history and the problem of suffering, as well as the writing of the biblical texts.

**REL 104 History of Christianity.** The purpose of this course is to explore the general development of Christianity throughout its 20 centuries of existence, paying special attention to the religious presuppositions behind Christianity and its complex relationship to its socio-cultural matrix. The course focuses on important moments in Christian history, including its inception as a Jewish religious movement set in motion by Jesus, its dissemination in the Greco-Roman world by Paul of Tarsus, its growth and triumph in the Roman Empire, the split between the Greek- and Latin-speaking churches, medieval Catholicism, the Reformation and rise of Protestantism, Christianity and the modern world, and contemporary movements and tendencies within the Christian churches.

**REL 105 Asian Search for Self.** An introduction to the intellectual and religious history of India. We investigate ways in which early Vedism, classical Hinduism, Buddhism, and Jainism conceive of the cosmos, meaningful human existence, and life's ultimate goals.

**REL 107 History of Islam.** The development of Islam from its origins in the Qur'an and Muhammad's teachings through the codification of the classical tradition in its various forms and finally to the living Islam of the contemporary world.

**REL 140 Classical and Scriptural Backgrounds.** This course addresses the Big Questions: Love, Death, War, Sex, Law, and more besides. We come to our readings through myth and history, art and philosophy, and a series of broad conceptual frameworks. Above all, however, this is a course in literary appreciation and influence: we read extensively in Homer and Virgil, in dialogues by Plato, in a broad selection of Greek tragedy (and one comedy!), and in a generous selection from Hebrew and Christian scriptures. Our aim is to encounter these as challenging, imaginative, absorbing, and enduring attempts to confront, articulate, and share the possibilities of life. We try to do justice to these texts in their own distinctive terms, but we strive as well to see why readers before us have prized them so highly for thousands of years and how we are to make sense of them in the 21st century. The readings are astonishingly rich and

rewarding, and we do our best to live up to them within the limits of a semester's work. First-year students are welcome!

**REL 147 Women in Judaism.** In this course we examine approaches to the body and gender as described and manifested in Jewish texts, rituals, and communal practice from the biblical period to the present. We look at interpretations of the body and its effect on the status of women in particular in the Bible and Talmud, paying close attention to the historical and cultural contexts of these interpretations. There is a strong focus on modern reevaluations of gender and the body and how such reevaluations have transformed what it means to be "Jewish." Topics include rites of passage, images of women in the Bible, and feminist theology as well as theories and depictions of the "Jewish body."

**REL 167 Speaking Stones.** An examination of grave stones and funerary architecture in Rochester's Mt. Hope Cemetery with a focus on symbolic connections between the living and the dead.

**REL 175 Religion and Chinese Society.** This course examines the complicated relationship between religion and society in China. It takes a sociological approach, emphasizing that religion should be studied as a social phenomena that closely interacts with the development of society at large. The focus is on contemporary times from the end of the 19th century through present. During this period, China experienced tremendous change. This course introduces how such change impacted and was expressed through religion, religiosity, and religious politics.

**REL 229 Religion and Violence.** Drawing upon historical and contemporary examples, students read a range of classic and contemporary theories that attempt to explain the complex relationship between religion and violence. Topics include sacrifice, scapegoating, war, terrorism, domination, sanctified violence, violent religious fantasy, martyrdom, end times, etc. Is religion inherently violent? What is the relationship between religion and nationality? Religion and constructions of alterity? How can a religion claim to be concerned with peace and non-violence yet promote violence?

**REL 236 Catholicism in America.** Catholics have been present in what today is called the United States from its earliest years as a British colony to the present, in which the Catholic population makes up roughly 25 percent of the nation as a whole. In this course we examine the principal historical events that have transpired over the years as the Catholic Church expanded from its colonial origins, became a church of immigrants, and subsequently part of the established social order.

**REL 254 Hindu Mythology.** A study of the great mythic narratives of Southeast Asia in texts such as the Bhagavad Gita and the Mahabharata.

### Arabic

**ARA 101 Elementary Arabic I.** An introduction to modern standard Arabic, including the alphabet, pronunciation, vocabulary, grammar, elementary conversation, and reading.

**ARA 103 Intermediate Arabic I.** Readings, drills, and continued study of grammar.

**Hebrew**

**HEB 101 Elementary Hebrew I.** Introduction to the structure of modern Hebrew. Practice in vocabulary, use, grammar, reading, and writing. Cross-listed with JST 101.

**HEB 103 Intermediate Hebrew.** Continuation of HEB 102 with emphasis on enhancing reading comprehension, writing, and speaking skills. Students are expected to have a good understanding of the structure of Hebrew, including familiarity with verb forms. Cross-listed with JST 104.

**HEB 204 Hebrew through Media and Literature.** Designed to develop advanced reading and conversational skills using various materials, including Israeli newspapers, Hebrew movies and songs, and texts from modern Hebrew literature (fiction and poetry). Writing skills are enhanced through a series of related home assignments. Review of Hebrew verbal system and syntactical structures and enrichment of vocabulary are also among the objectives of this course.

**Spring Semester**

**REL 100 Introduction to the Study of Religion.** In this course, students explore and are introduced to a) the complex interconnections between religion and national identity, politics, gender, and sexuality as well as everyday practices related to eating, dress/adornment, family life, etc., b) the ways in which religion has variously been defined with respect to the sacred, belief, ritual, practice, and experience, and c) the major approaches to the academic study of religion and central debates within the field of the study of religion.

**REL 102 Introduction to the New Testament.** Examination of the New Testament in its religious, historical, and literary context.

**REL 103 History of Judaism.** This course provides an overview of Jewish history, texts, traditions, practices, and beliefs and emphasizes Judaism as a living tradition, one that is subject to both continuity and change among its practitioners.

**REL 106 From Confucius to Zen.** The teachings, practices, and social impact of the major religious traditions of China and Japan.

**REL 157 African American Religious History.** Historical survey of religions as practiced by people of African descent living in North America. Christianity, Islam, and African-derived religions are examined. Through its canvassing of doctrinal and ritual frameworks, students are afforded an opportunity to view the diverse and complex terrain of African-American religion. Class format includes lectures, discussions, and film/music.

**ARA 102 Elementary Arabic II.** Continuation of ARA 101.

**HEB 102 Elementary Hebrew II.** Direct continuation of Elementary Hebrew 101 with emphasis on enhancing reading, writing, and speaking skills. Cross-listed with JST 103.

**HEB 104 Intermediate Modern Hebrew II.** Continuation of HEB 103.

**HEB 204 Hebrew through Conversation.** A conversational course designed to offer the opportunity to converse and discuss anything in Hebrew, from poetry to politics, depending on the interest of the class. Cross-listed with JST 204.

**TUR 102 Elementary Turkish II.** The second half of Elementary Turkish.

**TUR 204 Intermediate Turkish.** The second half of Intermediate Turkish.

**For more information, go to [sas.rochester.edu/re/](http://sas.rochester.edu/re/).**

**RUSSIAN STUDIES**

*“Every Russian . . . lives in multiple worlds: in a past that still shapes his thinking and language and habits; in the sometimes unbearable present, with its economic and psychological shocks; and in the future, which is even more unknowable, more unpredictable, than it is elsewhere . . . every Russian is, in some way, engaged in building a new reality, a new state, a new identity, a place in the greater world.”*

—David Remnick

*“Recent media accounts have argued that the U.S. government suffers from an absence of high-quality expertise on Russia . . . Moreover, the shortage of informed expertise transcends our borders. The House of Lords’ scathing 2014 report attacked the UK’s demolition of its Russian expertise and that Britain has sleepwalked through the crisis leading to the invasion of Ukraine. French analysts tell a similar story in France.”*

—“Countering Putin begins with knowing what his regime is saying” article in *The Hill* (American political newspaper published in Washington, D.C.)

**Information about the Program**

Russian studies is an interdepartmental program in the College that incorporates the perspectives of several disciplines and the linguistic, historical, and cultural background needed to understand Russia’s past, to analyze its present, and to make responsible assessments about its future.

The three departments providing the core faculty for this program are modern languages and cultures, history, and political science, but a concentration may include courses in, or cross-listed with, international relations, religion and classics, Judaic studies, Polish and Central European studies, film studies, women’s studies, comparative literature, and economics. The Russian studies curriculum, like Russia itself, is an evolving work in progress, with new

courses added and old ones revised to reflect new knowledge in this area and changing opportunities for graduates.

A Russian studies major or minor can be designated as belonging either to the humanities or social sciences, depending on the student's course choices. Students with a strong interest in Russian studies have done second majors in history, political science, international relations, and other fields. Russia has a history and culture that go back more than a millennium, while its democracy and market economy are relatively new. The Russian Studies Program prepares students not only to know about this area but also to work in Russia or to prepare for future graduate study and careers in the field.

### Program Advice for First-Year Students

Almost any course in our curriculum that interests you is a good place to get started, whether it is language, literature, current events, history, art history, or an introductory course in international politics. All Russian studies courses are open to first-semester first-year students.

### Clusters

The program offers two humanities clusters: 1) Introduction to Russian Culture and Civilization, and 2) Russian Studies. There is also a Russian Studies Cluster in the Social Sciences—Great Experiments: Identities and Cultures in Transition. Additional Russian clusters are offered through the Department of Modern Languages and Cultures and the Department of History. All Russian-related courses fit one or more clusters.

### Study Abroad

Students who major or minor in Russian studies are strongly encouraged to take part in the Summer Program at St. Petersburg University run by the Department of Modern Languages and Cultures or the semester-long CIEE program sponsored by the College. Students participating in the summer program are eligible for a Mildred R. Burton Travel Fellowship.

## Courses

### Russian Language

Incoming students with a background in Russian should consult the Russian program in the Department of Modern Languages and Cultures for placement. There are courses at the beginning, intermediate, and advanced levels, and fall of the first year is an ideal time to begin with 101 or to continue the study of Russian.

### Russian Studies

The following courses given in English may be of particular interest to first-year students:

#### Fall Semester

**RST 126 Russia Now.** Students learn how to analyze ongoing political, economic, and social changes in the world's largest country through the use of print and electronic sources along with background reading on Russia since the end of Communism. In English.

**RST 160 The New Europe.** Students follow events in Europe

(from Spain to Russia) using print and electronic sources. Weekly discussions, analysis, three written briefings on developments. In English.

**RST 237 God, Justice, Crime, and Punishment: The Novels of Fyodor Dostoevsky.** Why do innocent people suffer? How can a good and all-powerful God allow so much injustice in the world? Is it okay to kill someone if doing so would bring about good? If there is no God, is everything allowed? When—if ever—can innocent people be held responsible for the crimes others commit? These are the questions at the heart of Fyodor Dostoevsky's novels. The problems of social justice, crime and punishment, and the existence of God constitute a thread that runs throughout his career. We discover that the answers Dostoevsky poses to these questions are as unexpected, contradictory, fascinating, and life changing as his novels themselves. In English. First-year students welcome. (Fall)

**RST 289 Dangerous Texts.** When modern Russian literature began to evolve in the mid-1600s, the printed or written text was immediately seen as a potential danger to the power of Church and State. In this course we examine dangerous texts from the 17th century to the present to see what aspects of texts and their authors were seen as threats and how these threats were dealt with. We also see the ways in which writers did indeed perceive themselves as a second government and how this changed the way they wrote. The reading list includes works by Avvakum, Radishchev, Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, Tolstoy, Babel, Mayakovsky, Mandelstam, Pasternak, Yevtushenko, Solzhenitsyn, Voinovich, Grossman, and Sinyavsky/Tertz. The goal of this course is to arrive at an understanding of the unique role played by literature in Russian history. In English. (Fall)

**PSC 106 Introduction to International Relations.** This course provides students with the background and conceptual tools they need to understand contemporary international relations. The course introduces students to the wide range of issues that make up the study of international relations, including the workings of the state system, the causes of international conflict and violence, and international economic relations.

#### Spring Semester

**RST 126 Russia Now.** Tracking political, economic, and social events in contemporary Russia, discussing them in class and writing briefing papers. In English.

**RST 267 Russia Goes to the Movies.** The dawn of the age of movies coincided with the Russian Revolution, and film was Lenin's favorite art form. The course surveys Russian film from the beginnings to the present. The course investigates the major role that cinema played in shaping the national and political identity of the Soviet Union and looks at what was artistically interesting and popular about these films, some of whose directors, like Eisenstein and Tarkovsky, are among the world's most influential filmmakers. In English.

**RST 222 Russian Drama.** An introduction to the Russian theater in its cultural and political context, with close readings of plays from the late 18th century to the late 20th century. The early comic masterpieces of Griboedov and Gogol held up a mirror to social problems and gave birth to plays on social themes by Ostrovsky and Tolstoy in the late 19th century. The plays of Anton Chekhov at



the turn of the century both anticipated and highly influenced the developments of modern theater in the decades to follow, both in Russia and abroad. We conclude by examining theater in the Soviet period in plays by Kharms, Bulgakov, and others. In English.

**HIS 132 Imperial Russia.** This course examines the history of the Russian Empire from the reign of Peter the Great (1692–1725) to the revolutions of 1917. Topics include Peter’s westernization of Russian elites and the costs thereof, the Pugachev rebellion of 1773–75, the spread of Enlightenment ideals to Russia during the Napoleonic Wars, the abolition of serfdom, Sergei Witte’s industrialization drive, socialist movements in Russia, World War I, and the causes of the revolutions of 1917.

**For more information, go to [sas.rochester.edu/mlc/undergraduate/russian-studies.html](http://sas.rochester.edu/mlc/undergraduate/russian-studies.html).**

## STATISTICS



*“Hiding within those mounds of data is knowledge that could change the life of a patient or change the world.”*

—Atul Butte, Stanford University

### Information about the Program

On the news, in research studies, and even on social media, we frequently encounter reported statistics, and it is quite powerful and essential to have the knowledge to decipher exactly what these statistics mean. With a formal background in statistics, you will get the training to use data to solve problems relating to the environment, public safety, health care, sports, politics, and the economy, among other applications. Learning to understand and use statistics truly is an interdisciplinary skill that is becoming ever more important as data increasingly is used to inform decisions in almost every field and industry.

In the Statistics Program, our goal is to ensure that students have the knowledge needed to thrive in making data-driven decisions. To meet this aim, we teach a wide range of courses in applied statistics, modern computational methods, and statistical theory. We offer both a major and a minor in statistics. Many students choose to double major in statistics and another area such as economics, business, political science, epidemiology, mathematics, or other health

science majors. We also offer a joint major in mathematics and statistics. If you are interested in pursuing a career as an actuary, you may also be interested in our actuarial certificate. For more information relating to our program, courses, and advising, please visit our website at [www.sas.rochester.edu/stt](http://www.sas.rochester.edu/stt).

### Departmental Advice for First-Year Students

Students looking to take a first course in statistics should consider one of STT 211, STT 212, or STT 213. These are applied introductory statistics courses, and students may earn degree credit for only one of these courses. STT 211 is recommended for students wanting a terminal course who likely will not encounter many statistical analyses in their academic future. STT 212 is the most general introductory statistics course and is recommended for most students in the social and natural sciences. STT 213 is recommended for students with strong mathematics backgrounds and who will likely be majoring in economics, business analytics, finance, computer science, or statistics.

Any students who have either transfer or AP credit for STT 212 should consider taking STT 216 or STT 218, which are intermediate-level applied courses that build upon the concepts from introductory statistics. Students intending to major in statistics who do not have transfer or AP credit should take STT 212 or STT 213 in their first semester. We also recommend taking at least one intermediate applied course and beginning a calculus sequence during the first year. For students looking for a first theory course in statistics, we recommend STT 201.

### Advanced Placement

Students who have received a score of 4 or 5 on the AP exam in Statistics will be given credit for STT 212. Any student with AP credit who wishes to receive credit for STT 213 instead of STT 212 should take the STT 213 Equivalency Exam by making arrangements with the Statistics Program. The exam is offered at the beginning of both the fall and spring semesters. For more information, see [sas.rochester.edu/stt/resources.html](http://sas.rochester.edu/stt/resources.html).

## Courses

**STT 211 Statistical Literacy and Applied Methodology.** This course focuses on conceptual understanding of statistics and basic analyses. Topics include data collection and summarization, probability rules and distributions, parameter estimation, and methods of statistical inference, with some discussion of regression analysis, ANOVA, and contingency tables. Calculations are performed using graphing calculators. This course is recommended for students looking for a terminal statistics course that provides a foundation in statistical understanding. (Fall and Spring)

**STT 212 Applied Statistics I.** This course focuses on providing the tools and computational experience needed to analyze data in the applied setting. Topics include data collection through experiments and observational studies, data summarization, probability rules, statistical distributions, parameter estimation, and methods of statistical inference, regression analysis, ANOVA, and contingency tables. Calculations are performed in R/RStudio. This course is recommended for students majoring/minoring in statistics and most students in the social and natural sciences. (Fall and Spring)

**STT 213 Elements of Probability and Mathematical**

**Statistics.** This course focuses on the probability and statistical theory underlying the estimation of parameters and testing of hypotheses. Topics include data exploration and summarization, axioms of probability, distribution theory, parameter estimation, statistical inference, and linear correlation and regression analysis. Calculations are performed in R/RStudio. This course is recommended for students majoring in statistics, economics, or computer science or students looking for a more mathematical introduction to statistics. (Fall and Spring)

**STT 216 Applied Statistics II.** This course focuses on the practical use of statistical methods beyond what is covered in introductory courses. Topics include randomization tests, bootstrapping, non-parametric tests, ANOVA models (fixed, random and mixed models, crossed and nested), multiple comparisons and linear contrasts, multiple linear regression, binary logistic regression, and related topics. Minitab is used for calculations, and there is a strong emphasis on assumptions and interpretation of results. Prerequisite: STT 212 or STT 213. (Fall and Spring)

**STT 218 Categorical Data Analysis.** In the first portion of this course, two-way and three-way tables are introduced, along with inferential methods for determining significant associations between categorical responses. In the second portion of the course, emphasis is placed on regression models for categorical outcomes, with particular attention being given to logit and probit. Computation is performed in R/RStudio. Prerequisite: STT 212 or STT 213. (Fall)

**For more information, go to [sas.rochester.edu/stt/](http://sas.rochester.edu/stt/).**

## SUSTAINABILITY (MULTIDISCIPLINARY STUDIES CENTER)



*“The great challenge of the twenty-first century is to raise people everywhere to a decent standard of living while preserving as much of the rest of life as possible.”*

—Edward O. Wilson

### Information about the Program

The minor in sustainability is intentionally interdisciplinary and includes courses from the natural sciences, social sciences, and humanities. The goal of the minor is to provide a curriculum that encourages students to learn to communicate and to solve problems of societal relevance that straddle disciplinary boundaries in sustainability and global change.

Students wishing to satisfy the natural sciences or social sciences divisional area of the Rochester Curriculum must take at least three of the six classes from that division. Students interested in focusing on the humanities are encouraged to consider the Environmental Humanities minor.

#### Program Advice for First-Year Students

Courses appropriate for first-year students are listed below. Several other courses in the minor are upper-level courses and may have required prerequisites. Students interested in the upper-level courses are encouraged to take appropriate introductory courses in the departments of interest.

#### Advanced Placement

Students who have scored a 4 or 5 on the AP Environmental Science exam may use that credit for EES 103 Introduction to Environmental Science.

#### Clusters

There are three clusters in sustainability: one in humanities, one in natural sciences, and one in social sciences. The clusters are Sustainability and the Humanities (Humanities); Society and Sustainability (Social Sciences); and Science and Sustainability (Natural Sciences).

## Courses

### BIO 104 Ecosystem Conservation and Human Society.

*(Natural Sciences)* As the natural resources on which human society depends are depleted, the need for sound conservation policies increases. The course examines a new approach in conservation biology that identifies and places economic value on the services that natural ecosystems provide. Such services are basic to sustainable societies and include clean water and air, waste decomposition, pollination and farm land productivity. Major themes the course covers include an overview of other approaches in conservation biology, a review of the services that ecosystems provide, ways the value of these services are determined, and how this novel approach is influencing economic and political policy at local, national, and international levels. (Fall)

### EES 103 Introduction to Environmental Science. *(Natural Sciences)*

A comprehensive overview of fundamental scientific concepts in environmental science and the interactions between humans and their environment. Modules address ecological and human systems; air and water; energy and climate; and food and waste. The goals are to provide students with critical thinking skills and a level of scientific literacy for further study of environmental issues and to create informed and engaged citizens and consumers. (Spring)

### EES 105 Introduction to Climate Change. *(Natural Sciences)*

This course explores the Earth's dynamic climate system through lectures, discussions, and computer-based modeling of climate processes. Fundamental and important questions that are considered include: What are the main factors that determine the Earth's climate? What forces can drive climate to change? What can we learn from climate change in the Earth's distant past? How do we know that our climate is now changing? What can we expect from the Earth's climate in the near future, and how would it affect us? (Fall)

*Prerequisite courses students may wish to consider to prepare for sustainability minor upper-level courses*

**ECO 108 Principles of Economics.** The fundamentals of microeconomic and macroeconomic theory, with applications; preparation for subsequent economics courses. *This course is a prerequisite for ECO 238 Environmental Economics; may be satisfied with AP credit.* (Fall and Spring)

**ECO 207 Intermediate Microeconomics.** The economics of consumer choice and the demand for goods; producer choice, including the supply of goods and the demand for labor and other inputs; the effects of competition and monopoly power on prices and production. *This course is a prerequisite for ECO 238 Environmental Economics.* (Fall and Spring)

**PHL 103 Contemporary Moral Problems.** An introduction to moral philosophy as applied to current topics. *May be used as an option for a 100-level prerequisite for PHL 230 Environmental Justice.* (Fall and Spring)

*Note: The following course may have appropriate content but has not been officially approved for the sustainability program. Please see the sustainability faculty advisor for approval.*

**HIS 227 Podcasting History: Hear UR.** *(Social Sciences)* *Hear UR* is a history-oriented podcast that takes on a subject related to the environmental history of Rochester. Over the course of this semester, this class researches, develops, and produces one season of episodes for *Hear UR*. Students divide into teams of three, where they take on the roles of "Producer," "Lead Researcher," or "Engineer." Together they develop the subject matter of the season and episodes; locate primary sources to interpret; identify a body of secondary literature; draft and redraft podcast scripts; master the use of microphones, recording studios, and audio editing software; create a website to host each episode, where they post a written article on the same topic, provide primary source images, additional links, and script; finally they organize and execute a public rollout of the season, using social and traditional media platforms, local public radio and television, and University communications channels. (Fall)

*For more information, go to [sas.rochester.edu/sus/](http://sas.rochester.edu/sus/).*

## THEATER COURSES

See English for program details.

## THE WRITING, SPEAKING, AND ARGUMENT PROGRAM



*"I find great challenge in presenting an argument and reward in selling an idea. To me, writing is more gratifying than balancing a chemical equation, more expressive than musical composition, and more difficult than calculus."*

—Ian Stanley  
Psychology Major, Class of 2012

## Information about the Program

The Writing, Speaking, and Argument Program (WSAP), in concert with faculty across the College, builds a strong community of undergraduate and graduate writers, speakers, and researchers. Writing, speaking, and argument enable us to discover, develop, test, and communicate our ideas. Effective communication—including critical thinking, problem solving, organization of ideas, and clarity and



power of expression—is of enormous importance in both academic and professional settings. Through communication, we see the truth, utility, or beauty of what we know and make our knowledge have an impact on the world at large. WSAP leads the effort to familiarize students with key principles and strategies for becoming successful communicators across different modes and contexts and fosters a culture of open, honest, and critical communication.

WSAP is home to the Primary Writing Requirement (PWR); the undergraduate English for Academic Purposes Program (EAPP); a range of undergraduate writing courses related to writing, speaking, argument, and tutoring; and the Writing and Speaking Center, where students can find tutoring services. WSAP offers one minor that introduces students to the different disciplinary practices around writing, speaking, and argument. The minor also provides a flexible writing curriculum to complement students' academic and professional interests. To begin to explore the breadth of writing studies, the program offers clusters that focus on language, digital and multimodal composition, writing theory and practice, and community engagement.

### Primary Writing Requirement and Placement Information

All students at the University of Rochester, whether incoming first-year students or transfers, must satisfy the Primary Writing Requirement. The majority of students fulfill the requirement by earning a “C” or better in WRT 105, Reasoning and Writing in the College, or WRT 105E or WRT 105A and B, versions of 105 chosen by students who need more support to meet the demands of college-level writing. Students who believe that they are already proficient college writers may petition to substitute a University of Rochester writing-intensive course for WRT 105. The substitute course may not also be used to fulfill the Upper-Level Writing Requirement. Transfer students who have completed a WRT 105 equivalent at another institution and received a “B” or better may petition to use this course to satisfy the Primary Writing Requirement. For more information on satisfying the Primary Writing Requirement, including instructions on how to access the Writing Placement Survey, please refer to [writing.rochester.edu](http://writing.rochester.edu).

Students admitted to the College through the English for Academic Purposes Program fulfill the requirement by earning a grade of “C” or higher in WRT 103, EAPP Critical Reading, Reasoning, and Writing, and WRT 104, EAPP Research, Reading, and Writing. For more information on EAPP placement and courses, please refer to <http://writing.rochester.edu/eapp>.

### Writing and Speaking Center Services

The Writing and Speaking Center offers a wide variety of writing and speaking support services for undergraduate students of all levels and in all disciplines. Our office is staffed by graduate-student Writing Consultants and undergraduate Writing and Speaking Fellows from the humanities, the social sciences, and the natural and applied sciences. Our tutors provide individualized feedback and assistance on all types of academic writing and speaking. We invite students to use our services during any stage of the writing process, from brainstorming ideas to polishing a final draft. Similarly, students can visit a Speaking Fellow at any point as they are developing or practicing a presentation. The Writing and Speaking Center is located on the ground floor of Rush Rhees Library, G-122. For

more information about face-to-face and online tutoring services, please visit our website at <http://writing.rochester.edu/tutoring> or call (585) 273-3577.

## Courses

**WRT 105 Reasoning and Writing in the College.** WRT 105 introduces students to disciplinary writing at the college level through instruction in small sections that focus on the act of writing. Section topics have ranged from “Adolescence: War or Peace” to “Searching for Whales: Myth, Science, and Ecological Sustainability” and cover a range of subjects and disciplines. The course provides instruction and practice in clear and effective writing and in constructing cogent and compelling arguments as students draft and revise numerous papers of different forms and lengths. Students consider the roles of audience and purpose in shaping the organization, style, and argumentative strategies of their own papers while they learn to become critical readers of their writing through peer critiques and revision and editing workshops. Each section has unique content. (Fall and Spring)

**WRT 105E Reasoning and Writing in the College.** WRT 105E is an extended version of Reasoning and Writing in the College. While WRT 105 and WRT 105E have the same expectations for completion, WRT 105E is intended for students who decide that they need a more supported writing experience to meet the demands of college writing. All sections of WRT 105E include an additional class session each week, are taught in computer labs, and are limited to 10 students. WRT 105E students who have worked diligently but have not attained a B- or better may take an incomplete and sign up for the Extension, a weekly workshop and tutorial that allows students to raise their final grades and satisfy the Primary Writing Requirement. Each section has unique content. (Fall and Spring)

**WRT 105A Reasoning and Writing in the College: First Course in WRT 105A-WRT 105B Sequence.** WRT 105A (Fall) and WRT 105B (Spring) distribute the work of WRT 105E across two semesters, with WRT 105A covering the first half of WRT 105E. WRT 105A immerses students in the experience of academic writing, with a particular emphasis on analyzing, using, and documenting scholarly and non-scholarly texts. It provides instruction and practice in constructing cogent and compelling arguments as students draft and revise two short argumentative essays. Students develop and test their ideas through discussion, informal writing, peer critiques, and self-assessments. All sections of WRT 105A and B revolve around a theme and include a weekly writing group in which students do the work of writing with immediate support from the course instructor. To proceed from WRT 105A to WRT 105B, students must earn a grade of “C” or higher. (Fall)

**WRT 105B Reasoning and Writing in the College: Second Part of WRT 105A-WRT 105B Sequence.** The second half of the WRT 105A-WRT 105B sequence, WRT 105B immerses students in the experience of academic writing, with a particular emphasis on analyzing, using, and documenting scholarly and nonscholarly texts. It provides instruction and practice in constructing cogent and compelling arguments as students draft and revise a proposal and an 8- to 10-page argumentative research paper. Students develop and test

their ideas through discussion, informal writing, peer critiques, and self-assessments. All sections of WRT 105A and B revolve around a theme and include a weekly writing group in which students do the work of writing with immediate support from the course instructor. WRT 105B students who have worked diligently but have not attained a grade of “B–” or higher may take an incomplete and sign up for the Extension, a weekly workshop and tutorial program that allows students to continue working on their writing, raise their final grades, and satisfy the Primary Writing Requirement. (Spring)

**WRT 108 Workshop in Writing.** This course offers ongoing practice and instruction in writing and critiquing writing. Guided by a writing consultant, students plan, draft, and revise their writing; critique each other’s work; assess their own writing; and participate in workshops on writing issues shared by the group. The semester’s work culminates in a final portfolio that features polished essays and an overall self-assessment. WRT 108 is a two-credit course, which is graded pass/fail. Prerequisite: WRT 105/WRT 105E or alternative satisfaction of the Primary Writing Requirement. (Fall and Spring)

**WRT 245 Advanced Writing and Peer Tutoring.** Prepares sophomores, juniors, and seniors enrolled in five-year programs from the humanities, sciences, and the social sciences for work as writing fellows. Course design facilitates the development of a strong, intuitive writer and speaker in order to become a successful reader, listener, and responder in peer-tutoring situations. Ample writing and rewriting experiences, practice in informal and formal speaking, and the critical reading of published essays and student work enhance students’ ability to become conscious, flexible communicators. Before tutoring on their own, students observe writing fellows and writing center consultants conduct tutoring sessions. On completion of the course with a B or better, fellows should be prepared to accept their own hours as peer tutors. This course satisfies a requirement for the Citation for Achievement in College Leadership. Prerequisites: Interested students must apply. Minimum GPA of 3.0. (Fall)

**WRT 247 Spoken Communication and Peer Tutoring.** Prepares selected sophomores, juniors, and eligible first-year students for work as Speaking Fellows. This course focuses not only on the skill of public speaking, but also on peer tutoring and assisting students with their own forms of spoken communication. In this course, we examine various components of presentations, including effective use of visual aids and professional delivery styles. We also explore several types of spoken communication for different purposes and audiences, including argumentative and descriptive speeches, interviews, and group presentations. Through analyzing, studying the construction of, and creating and delivering their own presentations, students improve their own speaking styles and develop the skills necessary to aid their peers in constructing and revising presentations. By the end of the semester, students should be ready to take on their own hours as peer tutors. This course satisfies a requirement for the Citation for Achievement in College Leadership. Prerequisites: Interested students must apply. Minimum GPA of 3.0. (Spring)

**WRT 251/ENG 288/LIN 160 The Rhetorical Sentence.** (Fall)

**WRT 252/ENG 136 Principles and Practices of Copyediting.** Prerequisite: PWR satisfied. (Spring)

**WRT 253/BCS 163 Cognition and Writing.** Prerequisite: PWR satisfied. (Fall)

**WRT 260 Writing Across Technologies.** Prerequisite: PWR satisfied. (Fall)

**WRT 261/DMS 250/ENG 288 Writing in a Digital World.** Prerequisite: PWR satisfied. (Spring)

**WRT 262/BIO 274W Reading and Writing about Research in the Social, Natural, and Applied Sciences.** Prerequisite: PWR satisfied. (Spring)

**WRT 263/ENG 289/LTS 263 Translation: Interpreting and Adapting.** This writing studies course counts toward the Citation in Community-Engaged Scholarship. (Spring)

**WRT 265 Writing Across Disciplines: Argument and Evidence.** This writing studies course counts toward the Citation in Community-Engaged Scholarship. (Fall)

**WRT 266 Writing With Social and Political Purpose.** This writing studies course counts toward the Citation in Community-Engaged Scholarship. (Fall)

**WRT 267 Legal Writing and Analysis.** This writing studies course counts toward the Citation in Community-Engaged Scholarship. (Spring)

**WRT 282 Research Methods, Writing Studies.** Prerequisite: PWR satisfied. (Spring)

For a complete listing of courses and descriptions, go to [writing.rochester.edu/undergraduate/courses](http://writing.rochester.edu/undergraduate/courses).

**For more information, go to [writing.rochester.edu](http://writing.rochester.edu).**

# GRADUATE PROGRAMS

## Simon Business School



### Advice for First-Year Students

The College signed an Admission Partnership with the Simon Business School in October 2006. The Admission Partnership agreement offers students an opportunity to receive a \$10,000 scholarship if they enroll in a full-time Simon MBA or MS program any time after graduation from the College. Additionally, the Simon School specifically targets students with less than three years of post-college work experience for admission into our MS programs. Candidates for the MBA program generally have several years of work experience prior to entry. Students from any academic major are eligible to apply; however, coursework in economics, accounting, calculus, and statistics is recommended, both in preparation for the MBA or MS curriculum and as an indicator of interest and aptitude for a business career. Graduate Management Admission Test (GMAT) or Graduate Record Exam (GRE) scores are considered.

The Simon MS program may be suitable for individuals with focused career goals who desire a graduate business degree with only one additional year of study. Simon offers MS degree options in finance, marketing analytics, business analytics, and accountancy. While candidates are evaluated on a variety of criteria, Simon is particularly interested in identifying candidates who show promise of leadership in tomorrow's business world by combining a positive, can-do attitude with interpersonal skills, intellectual talent, entrepreneurial orientation, and personal integrity.

For an undergraduate student applying as a senior to Simon for a full-time MS degree program, the GMAT or GRE may be waived based upon a cumulative GPA of 3.3 and meeting other criteria. Please contact the MBA/MS Admissions office at [admissions@simon.rochester.edu](mailto:admissions@simon.rochester.edu) or (585) 275-3533 or visit our office at 245 Gleason Hall for more information. If you are interested in exploring undergraduate business courses, please visit the program website at [rochester.edu/college/bsb/](http://rochester.edu/college/bsb/) or consult the business advisor in the Undergraduate Business Program Office in 2-211 Carol Simon Hall. Questions may be emailed to [hillary.tatar@rochester.edu](mailto:hillary.tatar@rochester.edu).

**For more information, go to [simon.rochester.edu](http://simon.rochester.edu).**

## Margaret Warner Graduate School of Education and Human Development



*“Education is a social process. Education is growth. Education is not preparation for life; education is life itself.”*

—John Dewey

### Advice for First-Year Students

The Warner School is a graduate school for students with passion, commitment, and drive who aspire to improve the human condition as leaders in education, broadly conceived as supporting learning and development in a variety of contexts and across the life course. Warner is dedicated to fostering a learning community that represents and builds on the rich diversity of human experiences, backgrounds, cultures, histories, ideas, and ways of living. The Warner School prepares teachers, counselors, K–12 and higher-education administrators, helping professionals, policy analysts, educational policymakers, program evaluators, scholars, researchers, and consultants to enter our nation's most challenging arena and become a powerful force for equity and positive change.

The Warner School offers a wide array of academic programs, including master's and doctoral degree programs that may be of interest to undergraduates considering graduate work in education and human development. Students are encouraged to take courses in these programs as undergraduates, both to explore the interesting intellectual and career opportunities available in education and to possibly get a jump start on graduate work. Many undergraduates apply to the school's programs in their senior year. In addition to the core programs in teaching and curriculum, counseling, human development, applied behavior analysis (ABA), higher education, K–12 school leadership, education policy, online teaching, and program evaluation, Warner has an interdisciplinary program in



health professions education that is offered in collaboration with the University of Rochester School of Nursing and School of Medicine and Dentistry. There is also a new certificate as well as a master's program for undergraduates interested in teaching English abroad.

The programs tackle enduring challenges in education and human development with fresh, nontraditional approaches. Warner School students think deeply about the many ways that teaching, learning, and development shape lives and societies. By combining research and practice, we work to improve schools and institutions and to make communities more just.

While the University does not offer a bachelor's program in education, undergraduates interested in education, counseling, and human development—and the many issues related to schools, socialization, learning, leadership, community mental health, and change—are encouraged to take courses at the Warner School. Issues such as relations among race, gender, language, ethnicity, class, disability, sexuality, and schooling; uses of technology as teaching and learning tools; interdisciplinary research and its application to human learning and development; community mental health counseling; ties among economic, social, and educational practices and policies; community-based engaged scholarship; entrepreneurship and innovation involving education; and other matters of significance to contemporary society may be studied at the Warner School.

Undergraduates are encouraged to explore Warner School courses offered in teaching and curriculum, higher education, education policy, counseling, human development, online teaching, entrepreneurship, and health professions education. Such courses may complement undergraduate programs in the College and/or offer undergraduates the opportunity to explore new intellectual areas and career opportunities in the health, human services, and education professions. It may even be possible to begin studies for specific careers at the Warner School as an undergraduate. Starting teacher education coursework as an undergraduate provides students with the opportunity to explore and better understand the teaching profession and can allow for the completion of a master's degree and New York State Teaching Certification in only one additional year of postgraduate study. Students are also encouraged to explore the new certificate program to teach English abroad.

The Warner School offers a number of scholarship opportunities, including time-limited 50 percent guaranteed scholarships for programs leading to New York State teaching and school counseling certifications for qualified University of Rochester undergraduates who are interested in pursuing graduate study at the Warner School. For a complete listing of scholarship opportunities, visit [warner.rochester.edu/admissions/scholarships](http://warner.rochester.edu/admissions/scholarships).

Students who are interested in a career in education and human development are encouraged to meet with a Warner School admissions counselor to learn more about programs and opportunities for coursework as an undergraduate. The Office of Admissions offers day and evening appointments for student counseling and school tours. The Warner School is housed in LeChase Hall, located on the historic Wilson Quadrangle between Todd Union and Wilson Commons on the River Campus.

***For more information, go to [warner.rochester.edu](http://warner.rochester.edu).***

# NOTEWORTHY EDUCATIONAL OPTIONS

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## GWEN M. GREENE CENTER FOR CAREER EDUCATION AND CONNECTIONS

### Career Exploration and Education

The Gwen M. Greene Center for Career Education and Connections aims to enhance individual career readiness, connect organizations and talent, and transform our communities through education and collaboration. The Greene Career Center assists students in achieving their individual career goals by providing them with the resources and tools needed to develop connections among their aspirations, academic pursuits, and cocurricular experiences.

### Advice for First-Year Students

The Greene Career Center is available to assist and support students throughout their career exploration. We recommend connecting with a Greene Career Center advisor by the second semester of your first year. This will allow you to get acquainted with various options, resources, and services our office provides.

### Handshake: Your Career Connection Resource

The Greene Career Center can assist students in a number of career-related areas ranging from résumé and cover letter assistance to identifying research opportunities and internships. For most of these services, students will need to first create a profile within Handshake.

As a student at the University of Rochester, you receive a Handshake account when you enroll. To update your profile, log in at <https://rochester.joinhandshake.com> with your NetID and password. Once you've updated your profile, you can then customize the platform to your liking. Customizing your Handshake profile and career interests is a critical part of your experience at Rochester, allowing you to

- schedule advising appointments,
- find employment and internship opportunities based on interest,
- discover on-campus events and programs,
- connect with alumni and employers.

### Career Communities

At the University, career communities are a way to connect students to information, resources, and people in order to explore interests. Career communities encourage exploration by exposing students to related industries and professions. Students are encouraged to explore multiple career communities that align with their goals and interests. Learn more at [rochester.edu/careercenter/communities/index.html](http://rochester.edu/careercenter/communities/index.html).

### Building Connections

Through connecting with alumni, employers, faculty, and staff, students can learn more about their chosen industries and receive advice about the skills and experiences that are needed in order to

achieve success. Students can explore industries by participating in alumni networking events and attending on- and off-campus programming as well as industry road trips to employer sites facilitated by the Greene Career Center. Furthermore, the Meliora Collective is an online mentoring platform exclusive to the University of Rochester community that connects students to alumni, peers, faculty, staff, and others for professional exploration and growth. Students are encouraged to sign up to begin developing meaningful connections today.

### Choosing Courses

Some courses have a direct connection to specific careers and may even be required to gain entry into professional programs. For example, students interested in medicine must complete prerequisite coursework in order to apply for medical school. Still other courses can play a role in your exploration of career options and offer you the chance to build knowledge and skills for any career community. As you choose courses for your first year, consider the following:

- **CAS 104: ROC Your Life (+ Career!), 1 credit**

CAS 104 is a seven-week dynamic course that applies a design-thinking framework and mindset to career exploration and development. Through self-reflection, readings, discussion, and in-class activities, students will be able to architect their experiences at Rochester and beyond and be better equipped to navigate academic, career, and life decisions. Open to first-year and sophomore students only.

- **Career Competencies**

There are several competencies associated with career readiness. As you select your courses and cocurricular activities, consider how they will develop your competencies. For more information and definitions of each competency, visit the College Competencies website at [rochester.edu/college/academics/competencies.html](http://rochester.edu/college/academics/competencies.html).

- **Prerequisite Courses for Careers in Health Care**

Students can meet most prerequisites for medical, dental, or veterinary programs by completing the requirements shown on the following page. Consult a departmental advisor to determine the most appropriate course level based on your previous coursework and major(s) of interest. While it is important for pre-health students to get an early start on science courses, there is no “one size fits all” schedule or timetable. In general, students find greater flexibility and success when spreading prerequisite courses out over four years of study.

For further information on prerequisite courses for health professions programs, please visit [rochester.edu/college/health/academics/index.html](http://rochester.edu/college/health/academics/index.html). Remember to also join the Healthcare, Human Services and Biomedical Research Career Community by selecting this “career cluster” in Handshake.

**For more information, go to [rochester.edu/careercenter](http://rochester.edu/careercenter).**

## PREREQUISITE COURSES FOR MEDICAL, DENTAL, AND VET PROGRAMS

Consider the options below in order to fulfill prerequisite coursework for most medical, dental, and veterinary programs. Please note that this is not an exhaustive list, and you should speak with a career advisor before registration.

SUBJECT AREA	COURSE REQUIREMENTS	COURSES THAT FULFILL PREREQUISITES
<b>Biology</b>	Two semesters of biology coursework with labs required.	BIO 110L, BIO 111L, BIO 198L, BIO 112L, BIO 113L, BME 258
	One semester of genetics is highly recommended.	BIO 190L, BIO 198L
<b>Biochemistry</b>	One semester of biochemistry required.	BIO 250L, CHM 262
<b>Chemistry</b>	Two semesters of Introduction to Chemistry with labs required.	CHM 131, CHM 132, CHM 137, CHM 211
	Two semesters of organic chemistry with labs required.	CHM 171, CHM 172, CHM 203, CHM 204
<b>Math/Statistics</b>	One semester of statistics required.	STT 211, STT 212, STT 214, BME 221
	Meet the University's calculus requirement for physics.	MTH 141, MTH 142, MTH 143, MTH 161, MTH 162, MTH 171
<b>Physics</b>	Two semesters of physics with labs required.	PHY 113, PHY 114, PHY 121, PHY 122, PHY 123, PHY 141, PHY142
<b>English/Writing</b>	6 credit hours required	WRT 105, WRT 105A, WRT 105B, WRT 105E, and upper-level writing requirement(s) within major

To better prepare for interview questions and standardized tests like the MCAT or DAT that address the psychosocial contexts of health, students are strongly encouraged to consider coursework in the humanities or social sciences. Students should meet with a Career Advisor to discuss their options.

**Examples of courses to consider:** MHB 210, PH 101, PH 116, PHL 102, PHL 225, PHL 311, PSY 101, PSY 171



COURSE NUMBERS AND TITLES

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BIO 110L	Principles of Biology 1 with Lab
BIO 111L	Principles of Biology 2 with Lab
BIO 112	Perspectives in Biology 1 with Lab
BIO 113L	Perspectives in Biology 2 with Lab
BIO 190	Genetics and the Human Genome
BIO 198L	Principles of Genetics with Lab
BIO 250	Introduction to Biochemistry with Lab
BME 221	Biomedical Computation and Statistics
BME 258	Biomedical Ultrasound
CHM 131	Chemical Concepts, Systems, Pract. I
CHM 132	Chemical Concepts, Systems, Pract. 11
CHM 137	Chemical Principles for Engineers
CHM 171	First-Year Organic Chemistry
CHM 172	First-Year Organic Chemistry II
CHM 203	Organic Chemistry
CHM 204	Organic Chemistry II
CHM 211	Inorganic Chemistry I
CHM 262	Biological Chemistry
MHB 210	Bioethics at the Bedside: How Clinicians Think Ethically
MTH 141	Calculus I
MTH 142	Calculus II
MTH 143	Calculus III
MTH 161	Calculus IA
MTH 162	Calculus IIA
MTH 171	Honors Calculus I
PH 101	Introduction to Public Health
PH 116	Introduction to the US Health System
PHL 102	Ethics
PHL 225	Ethical Decisions in Medicine
PHL 311	Seminar in Bioethics
PHY 113	General Physics I
PHY 114	General Physics II
PHY 121	Mechanics
PHY 122	Electricity and Magnetism
PHY 123	Waves and Modern Physics
PHY 141	Mechanics (Honors)
PHY142	Electricity and Magnetism (Honors)
PSY 101	Introduction to Psychology
PSY 171	Social and Emotional Development
STT 211	Statistical Literacy and Applied Methodology
STT 212	Applied Statistics I
STT 214	Biostatistics
WRT 105 (105A/105B/105E)	Writing Courses

## EDUCATION ABROAD

Students majoring in all academic disciplines may go abroad. By the time of graduation, about one third of University of Rochester undergraduates have had an international education experience. Most students study abroad in their junior year or in the first semester of their senior year, although a number of programs are open to sophomores. Education abroad during the summer is also an option. The University offers more than 75 programs in more than 40 countries in Africa, Asia, Australia, Europe, Latin America, and New Zealand. In addition to study abroad, there are credit- and non-credit-bearing internship, research, and service learning opportunities overseas. There's something for everyone!

University of Rochester students interested in education abroad experiences have an expanded selection of opportunities in exchange programs. Exchange programs offer students the option of directly enrolling for a semester or year of study at select partner institutions. Direct enrollment provides undergraduates the opportunity to explore and study abroad in a more independent, self-directed way by integrating fully into the campus community as a full-time student. Consult with an education abroad advisor about exchange opportunities in Australia, Hong Kong, Indonesia, Japan, Macau, Malaysia, Mexico, Peru, Poland, Singapore, South Korea, Sweden, the United Kingdom, and more. Students who participate in an exchange program are eligible to receive a \$2,000 grant.

Faculty-organized summer and other short-term programs offer students the opportunity to study closely with University faculty in and out of the classroom. Archaeology in Ghana, Italy, and Peru; Korean in Korea; and dance and music in Guinea are just some of our current offerings.

It's never too early to start exploring your options. The best way to find out more is to attend an education abroad information meeting and to meet with an education abroad peer advisor. Schedules are available on our website: [rochester.edu/abroad](http://rochester.edu/abroad). Students majoring in science and engineering are especially encouraged to begin exploring their options during their first year.

University of Rochester financial aid and scholarships apply toward University of Rochester semester programs. Advisors will also direct students to other education abroad scholarships. With careful planning, any student can go abroad!

The Center for Education Abroad (CEA) is located in Dewey Hall 2-161. Feel free to call (585) 275-7532 or email [abroad@rochester.edu](mailto:abroad@rochester.edu). The CEA staff looks forward to meeting you to help you plan your experience abroad.

## TAKE FIVE SCHOLARS PROGRAM

The Take Five Scholars Program, unique to the University of Rochester, provides free tuition for an additional year or semester of study designed to enrich a student's curriculum. Students admitted to the Take Five program pursue a sustained and coherent interdisciplinary topic of intellectual interest. The program offers an opportunity to learn for the joy of learning alone: Take Five courses may not be used to complete Rochester Curriculum requirements or requirements for major or to prepare for graduate school. Students may submit an application—once they've been admitted into a major—until the fall semester of their senior year. Some sample

program titles include “Media and Its Effect on Gender Roles and Perceptions,” “Chinese Sign Language Comparison and Analysis,” and “The Intricate Puzzle of the Mind.” Since its inception in 1986, more than 1,100 undergraduate students from the River Campus and the Eastman School of Music have become Take Five Scholars. There is currently no limit to the number of students accepted into the program, and new students are admitted each semester.

## e5 PROGRAM

The University of Rochester defines entrepreneurship as the “transformation of an idea into an enterprise that generates value”—intellectual, social, cultural, or economic. More than just a discrete set of business skills or practices, entrepreneurship is a way of thinking and approaching problems. The e5 Program provides selected students with the opportunity to devote one or two semesters, tuition-free, in their fifth year to the study and practice of entrepreneurship and experiential learning. Students may propose to participate in internships, special projects, business plan development, research into various facets of entrepreneurship, or analysis of how culture and public policy influence entrepreneurial activity. Applications may be submitted once students have been accepted into a major and up to the fall semester of the senior year.

## CERTIFICATE AND CITATION PROGRAMS

Certificate programs are taken in conjunction with, not in place of, majors. They are meant to supplement a student's chosen area of study and to formalize into a coherent whole, courses taken outside the area of the major. Specific requirements for each program are listed in the Undergraduate Bulletin.

College certificate programs administered through the Multidisciplinary Studies Center (MSC) are:

- **Actuarial Studies:** 7 courses and 2.5 GPA required. Must also demonstrate computer proficiency.
- **Literary Translation:** 7 courses. Students must earn a minimum grade of C in all certificate components. A maximum of 3 courses may be transferred from other schools; these courses must have prior approval of the faculty advisor.
- **Mathematical Modeling in Political Science and Economics:** 9–10 courses and 2.0 GPA required.

Note that courses used toward these certificates may not be taken on the S/F option. Completion of one of these certificates appears as a notation on the transcript. Information concerning these certificates is available from the Multidisciplinary Studies Center in Lattimore 203, and details are on its website at [rochester.edu/college/msc/](http://rochester.edu/college/msc/).

Other certificate programs available to students are

- **Stage Management** (administered by the Department of English)
- **Biophysics** (administered through the Department of Physics and Astronomy)—*under review by the New York State Education Department*

- **Medphysics** (administered through the Department of Physics and Astronomy)—*under review by the New York State Education Department*

Note also the following:

#### Citation for Achievement in College Leadership

This program recognizes those students who have developed leadership skills through specific academic study coupled with specific practical application. Students need to complete at least three different leadership experiences. Each leadership experience has two components:

1. An academic course (2-credit minimum) to prepare students for specific leadership work.
2. A specific leadership practicum to implement ideas from the preparatory course.

Completion of the citation will appear as a notation on the transcript.

A handout that includes all academic and practical components that have been authorized for use toward this citation is available at the Academic Services Counter in 312 Lattimore.

#### Citation in Community-Engaged Scholarship

Through pursuing an academic citation in community-engaged scholarship, students passionate about integrated learning and responding to community-identified needs are able to design a course of study and practice that complements the Rochester Curriculum and their chosen areas of study. The citation is designed to contextualize abstract theories, develop critical skills, and challenge assumptions that will prepare students to be effective agents of social change here at the University of Rochester and beyond. Requirements for successful completion include two 2-credit seminars in community-engaged scholarship, 12 credits of community-engaged coursework, and a community-engaged capstone typically undertaken in a student's senior year. Community-engaged scholars develop deep and meaningful relationships with their peers, faculty, and community partners while completing their course of study. The citation is a collaboration among the Rochester Center for Community Leadership, academic departments, and community partners across the bridge and across the globe. The Rochester Center for Community Leadership is located at 107 Lattimore Hall and at [community.leadership@rochester.edu](mailto:community.leadership@rochester.edu). Advisors are eager to meet with students to discuss interests and goals to make the most of their time in Rochester.

## PRESTIGIOUS FELLOWSHIPS AND SCHOLARSHIPS

The Fellowships Office, located in 4-209B Dewey Hall, coordinates our recruitment and advising program for prestigious national and international academic competitions such as the Beinecke, Gaither, Churchill, Critical Language, DAAD-RISE, Davis Projects for Peace, Fulbright, Gates Cambridge, Goldwater, Knight-Hennessy, Marshall, NSF, Rhodes, Schwarzman, Soros, Truman, Udall, and Yenching. Funding for these highly selective programs comes from various public and private sources outside of the University, includ-

ing international sponsors. Opportunities vary depending on classification and other eligibility factors. Sometimes nomination by a UR committee is required to compete for a fellowship, but there are also many awards that students can apply for directly; the Fellowships Office aids students in pursuing both.

These competitive fellowship programs provide financial rewards as well as career-related opportunities based on academic merit, in addition to other selection factors, including distinctive achievements in research, campus involvement, leadership, community service, and civic engagement. A few programs also consider financial need status. Some fellowships can be used only in the United States, but there are also programs for international experiences. Some of these programs provide funds to support undergraduate-level study and research, while others support advanced study and professional opportunities after the completion of a bachelor's degree. The Fellowships Office maintains information on and advises students applying for a selected group of high-profile awards. (We are not experts on every competitive award.) Becoming aware of these opportunities in the first year at the University of Rochester can better position students to present competitive applications in the future, which may be as early as the spring semester. Rochester students have been consistently successful in many of these competitions, and you, too, can join the list of winners.

The Fellowships Office invites students with outstanding academic and extracurricular records to apply for appropriate fellowships and scholarships based on the individual student's profile and goals; our professional staff mentor candidates throughout the application process. Applications often need to be started several months in advance of national deadlines. Students interested in learning more about these awards and the application process may attend an information session, visit the fellowships website at [www.rochester.edu/college/studentfellowships](http://www.rochester.edu/college/studentfellowships), or stop by the Fellowships Office in 4-209B Dewey Hall. Follow us on Facebook and Twitter at [/URFellowships](https://www.facebook.com/URFellowships). After reviewing published informational materials, students are encouraged to take the next step of visiting the office to discuss specific awards in light of their academic interests and aspirations.

Maybe there's a Critical Language Scholarship, Goldwater, Fulbright, or Rhodes in your future. Your first year is the perfect time to begin preparing for these potentially life-changing opportunities.

## SENIOR SCHOLARS RESEARCH PROGRAM

The Senior Scholars Program permits selected seniors to devote at least half of the entire final year to a single capstone project that can range from a piece of scholarly research to a work of artistic creativity. Senior Scholar projects are marked by intellectual engagement and coherence and by educational soundness and continuity. The projects may include coursework in addition to CAS 397: Senior Scholars Program, and are carried out under the supervision of a faculty advisor (or advisors). The formal application proposal takes place in spring of the junior year, although students are encouraged to meet with an advisor at any time to discuss the program. Contact the Multidisciplinary Studies Center, Lattimore 203, or visit the Senior Scholars webpage at [rochester.edu/college/msc/senior-scholars.html](http://rochester.edu/college/msc/senior-scholars.html) for more information.



# MAJORS AND MINORS

## MAJORS

### Natural Sciences and Engineering

Applied Mathematics  
 Audio and Music Engineering\*  
 Biological Sciences
 

- Biochemistry
- Cell and Developmental Biology
- Computational Biology
- Ecology and Evolutionary Biology
- Microbiology
- Molecular Genetics
- Neuroscience

 Biology  
 Biomedical Engineering\*  
 Brain and Cognitive Sciences  
 Chemical Engineering\*  
 Chemistry  
 Computer Science  
 Data Science  
 Earth and Environmental Sciences
 

- Environmental Science
- Environmental Studies
- Geological Sciences

 Electrical and Computer Engineering\*  
 Engineering and Applied Sciences

Engineering Science  
 Environmental Health  
 Geomechanics  
 Mathematics  
 Mathematics-Applied  
 Mathematics-Statistics  
 Mechanical Engineering\*  
 Optical Engineering\*  
 Optics\*  
 Physics  
 Physics and Astronomy  
 Statistics

### Social Sciences

American Studies  
 Anthropology  
 Business  
 Economics  
 Epidemiology  
 Financial Economics  
 Health, Behavior and Society  
 Health Policy  
 History  
 International Relations  
 Linguistics  
 Political Science  
 Psychology

## Humanities

American Sign Language  
 Art and Art History
 

- Art History
- Studio Arts

 Bioethics  
 Dance  
 English
 

- British and American Literature
- Creative Writing
- Language, Media, and Communication
- Theater

 Film and Media Studies  
 Modern Languages and Cultures
 

- Comparative Literature
- French
- German
- Japanese
- Russian
- Spanish

 Music  
 Philosophy  
 Religion and Classics
 

- Classics
- Religion

## INTERDISCIPLINARY MAJORS

African and African-American Studies  
 Archeology, Technology and Historical Structures  
 Digital Media Studies  
 East Asian Studies  
 Gender, Sexuality, and Women's Studies  
 Interdepartmental Studies  
 Russian Studies

\*Students in these programs may complete somewhat modified clusters.

## MINORS

African and African-American Studies  
 American Sign Language  
 Anthropology  
 Arabic  
 Archaeology, Technology, and Historical Structures  
 Art History  
 Astronomy  
 Audio Music Engineering  
 Bioethics  
 Biology  
 Biomedical Engineering  
 Brain and Cognitive Sciences  
 Business  
 Chemical Engineering  
 Chemistry  
 Chinese  
 Classical Civilization  
 Classics  
 Clinical Psychology  
 Comparative Literature  
 Computational Biology  
 Computer Science  
 Creative Writing  
 Dance  
 Digital Studies  
 East Asian Studies  
 Economics  
 Electrical and Computer Engineering  
 English Literature

Environmental Engineering  
 Environmental Geology  
 Environmental Humanities  
 Epidemiology  
 Epistemology  
 Ethics  
 Film and Media Studies  
 French  
 Gender, Sexuality, and Women's Studies  
 Geological Sciences  
 German  
 Greek  
 Health, Behavior, and Society  
 Health Policy  
 Health Psychology  
 Hebrew  
 History  
 Interdepartmental Studies  
 International Relations  
 Italian  
 Japanese  
 Jewish Studies  
 Journalism  
 Latin  
 Latin-American Studies  
 Legal Studies  
 Linguistics  
 Materials Science  
 Mathematics  
 Mechanical Engineering  
 Medical Anthropology

Medieval and Early Modern Studies  
 Metaphysics  
 Movement Studies  
 Music  
 Music and Linguistics  
 Music Cognition  
 Optics  
 Organizational Psychology  
 Paleontology and Evolution  
 Philosophy  
 Philosophy of Science  
 Physics  
 Political Philosophy  
 Political Science  
 Psychology  
 Psychology as a Natural Science  
 Psychology as a Social Science  
 Religion  
 Research in Visual Science  
 Russian  
 Russian Studies  
 Social and Emotional Development  
 Spanish  
 Statistics  
 Studio Arts  
 Sustainability  
 Theater  
 Visual Science  
 Women's Studies  
 Writing Studies









