COMPUTER SCIENCE @ ROCHESTER

Undergraduate Information FAQ

- **What is Computer Science?**
  In Computer Science, we study computational methods, called algorithms, for solving problems and the systems we build to run those algorithms. We study how to think about them, how to evaluate and compare them, and how to use them to develop solutions and applications.

- **What degrees do you offer in Computer Science?**
  We offer BS and BA degrees, as well as a Minor in Computer Science. The BS provides rigorous preparation in all core areas of computer science and is for students interested in cutting-edge R&D careers in industry or academia. The BA provides a more flexible course of study that is good for students with interdisciplinary interests. It is popular with double majors and students interested in careers in a computer-related discipline or industry. For those interested in developing mastery in a particular field, the program also provides the option to pursue a concentration in either Artificial Intelligence, Human-Computer Interaction, Systems or Theory.

- **Where do people with a Computer Science degree go after undergrad?**
  URochester CS graduates go to top graduate schools like MIT, CMU, Berkeley, Princeton, Stanford, Johns Hopkins and others. Some choose to go to work at companies ranging from Google, Microsoft, and Apple to startups working on data science, affective computing, virtual reality, and much, much more.

- **What kind of courses do you offer?**
  Our courses are divided into introductory and pre-major courses, core Computer Science courses, and advanced elective courses in many different areas. Course offerings are often associated with our faculty's research interests. The introductory and pre-major courses teach the basics of programming, algorithmic thinking, and the design and analysis of programs. Our core courses teach formal (mathematical) models of computation and their applications, principles of computer systems, foundations of artificial intelligence, and the theory of computation. Our advanced elective courses cover a wide spectrum, including web programming, machine learning, human-computer interaction, and computer architecture and security.

- **I'm a first-year. How do I get started in Computer Science?**
  Incoming first-years typically take CSC 171 and MATH 150 in their first term and CSC 172 and their first Calculus course in their second semester. Students with AP or other advanced credit can start with CSC 172 and MATH 150 (see *How will my Advanced Placement Computer Science work be considered toward my Computer Science curriculum?*)

- **I'm not a first-year but I want to get into Computer Science. How do I get started?**
  You need to take CSC 171 and MATH 150, followed by CSC 172. You then need to complete the additional requirements for the BS or BA degree. Please note that it is generally not possible to complete a CSC degree in two years (see *Can I start a major in Computer Science as a junior?*).

- **How many students major in Computer Science?**
  We currently graduate about 100+ majors per year. There is no cap on the number of Computer Science majors enrolled in our program. Currently, there are approximately 500 students in the CSC pipeline although not all have officially declared their majors.

- **How big are the classes in Computer Science?**
  An average enrollment for the introductory course CSC 171 is approximately 120 students, with smaller lab sections and peer-run study groups of about twelve students. The CSC core courses average about 50-70 students each. Enrollment in advanced courses have a smaller average of 30-60 undergraduates.

- **How will my Advanced Placement Computer Science work be considered toward my Computer Science curriculum?**
  The following exams will transfer as credit for the following CSC courses:
  AP Computer Science Principles, Score of 4 or 5, CSC 161
  AP Computer Science A Exam, Score of 4 or 5, CSC 171
  IB Computer Science higher level, Score of 5+, CSC 171
  A-Level Computer Science, Grade of A, CSC 171
  Students wishing to apply AP, IB, and/or A-level credit toward a major should discuss this with their College Advisor during Orientation to determine if placement in CSC 172 their first semester is appropriate. Our goal is to place you correctly so that you are neither over your head or bored with the material. We also want students to be prepared for the next level course they would be expected to take.

- **Do I need a computer in my room? What kind should I get?**
  Students are not required to have a computer of their own when they come to campus but nearly all students do. They can access the computer science labs remotely at their convenience, from their dorm room, library or lab using ssh protocols. It doesn't matter whether your computer is a Mac or a PC, dual boot, laptop or desktop. However, the department recommends against using a netbook or tablet for CS coursework. The network on campus can accommodate any computer. Each dorm room is wired through ResNet and there is wireless access around campus. Our department's systems run Fedora Linux. For more information about the kind of computer you can purchase with educational discounts, check out the UR Tech Store.

- **What types of research can students do as undergraduates, and how soon would I be able to do it?**
  Undergraduates interested in research can work on ongoing projects in systems, theory, artificial intelligence, and human-computer interaction. Research Opportunities can be found on our website and our weekly research group meetings are open to anyone. Students may need more advanced coursework to be active participants in certain projects. Interested students should approach faculty members in their area of interest and ask what level of expertise is required for them to be successful researchers. Some students begin working on research as early as their first year, while others may wait a little longer to get started.

- **What opportunities are there for me to work (including internships)?**
  On-campus job opportunities abound for computer-literate students! Whether you work for University Information Technology in the campus computing facility, for ResNet connecting the dorms, in departments doing computation on research, or at Strong Memorial Hospital in a medical application, there are plenty of jobs on campus.
  Students interested in gaining on-the-job experience during the summer have many options. In previous years, students have participated in summer internships from Google, Amazon and Facebook to IBM, NASA and Xerox. Other summer internship opportunities have included Khan Academy, Zappos and Goldman Sachs, etc. Students have also completed fellowships, REUs (Research Experiences for Undergraduates) or mentorships at MIT, the National Institute of Standards (NIST) and at other colleges around the country. Due to course scheduling, we do not have a formal co-op program for students to work full time through the academic year. We encourage students to work in the summers between academic years to get hands-on experience. Many students return to campus for their senior year with job offers from their summer employers.

Those seeking employment after graduation can work with URochester's Greene Career and Internship Center, follow leads sent directly to our faculty or staff, or network through our alumni working in well-placed positions throughout the computer industry. Recent graduates have entertained multiple offers with very competitive salary ranges at companies, big and small, throughout the country.

- **Can I study abroad as a CSC major?**
  Absolutely! The Department of Computer Science strongly encourages students to discover the benefits of the global experience provided by studying abroad. Many of our students have attended English-speaking programs in while taking courses in both technical and non-technical fields. Some students (many who double major in a foreign language) choose to go to countries where the courses are not in English and fulfill requirements for their foreign language major. If you are interested in studying abroad, a four-year course plan can be worked out to see which semesters may be optimal for your global experience. The most common places for CSC students to currently study are Australia, England, Hungary, Ireland, New Zealand, Scotland and Spain.

- **What kind of equipment is used in the department?**
  Student labs in the computer science department are equipped with workstations running Fedora Linux. There is an undergraduate lab for declared majors on the second floor of Wegmans Hall. Students may also connect remotely from anywhere to work on the servers. Students involved in research with faculty have access to a wide variety of high-performance computing clusters and specialized equipment in the Human-Computer Interaction and Machine Vision laboratories.

- **What can I do to better prepare for the Computer Science major?**
  Computer programming requires a lot of practice. If you have the opportunity to program in any language (Java, C, C++, Perl, Python, Ruby, LISP, etc.) it will benefit you. However, our curriculum is designed so that if you have never had any programming, you will have the ability to start with the basics and work your way up. Those students who have considerable coursework and experience in CS will also have opportunities for advancement at a more individual pace. Since student experience varies greatly, your Hajim Faculty Advisor will review your history before recommending your course of study.

- **Can I start a major in Computer Science as a junior?**
  Our program is designed to take four years. Depending on various factors early in an academic journey, some students complete their major requirements sooner. However, due to the sequential nature of the pre-major and core courses, it is impossible to complete the BS requirements and nearly impossible to complete the BA requirements in four semesters. Some introductory courses reserve spaces for first-years and/or sophomores. The department strongly advises against attempting to begin a Computer Science major in the junior year. Obtaining a minor would be a more realistic plan for a student with a late-developing interest in Computer Science.

- **Can I double-major in Data Science?**
  Computer Science and Data Science share many courses, so double-majoring is not allowed. However, students in Data Science may minor in CSC. If you are a CSC major interested in data science and analytics, you may choose your advanced electives in CSC to specialize in courses that Data Science students are required to take (such as CSC 240, CSC 246, and CSC 261).

- **What is the difference between Computer Science & Electrical and Computer Engineering? Can I do both?**
  Computer science focuses on software while computer engineers focus on hardware. The CS and ECE departments overlap and collaborate in the area of computer architecture. Although CS is part of the Hajim School of Engineering and Applied Sciences, its curriculum requirements are more similar to those of the College of Arts & Sciences. CS majors are required to complete two clusters, while ECE majors are required to complete only one. ECE majors are required to take physics and chemistry, but CS majors are not. The ECE program is accredited by ABET (the Accreditation Board for Engineering and Technology), which is significant for students who wish to become a licensed Professional Engineer. Computer scientists rarely become licensed Professional Engineers.

  We have had students who have completed both an engineering curriculum and the computer science curriculum. A student who chooses to tackle this difficult double degree should have some AP credits, excellent time-management skills, and have few outside activities that distract from the difficult workload. A student may also need to plan to overload courses each semester, take summer courses, or extend beyond 4 years. Students may also choose to minor in either, while majoring in the other degree.

- **What is the Hajim MS Early Assurance Program?**
  Applied for during the junior year, MS-EAP allows students to take core graduate-level coursework in their intended Master's program as electives during their undergraduate studies. MS-EAP creates an internal agreement ensuring that if a student takes up to 12 credits of graduate-level work and completes them with a pre-determined grade (B or higher) and meets all the criteria for acceptance into the graduate program, then this coursework is guaranteed to be accepted toward degree requirements for the graduate program (as core or electives). If the student additionally maintains a 3.5 GPA, they will be guaranteed admission to the MS program with a 50% tuition scholarship.

- **Is there a student organization for Computer Science majors?**
  There are several student organizations that are affiliated with Computer Science. Computer Science Undergraduate Council (CSUG) is an active group composed of students at all grade levels that does both social and academic events. One of their annual events includes DandyHacks which is a 42-hour long hackathon. Other clubs include Women and Minorities in Computing (WiC-MiC), Google Developer, Girls Who Code, RocLab, UR Robotics, and competition teams for the ICPC Programming Competition. These clubs give students hands-on experience with application design, problem solving and a "maker" culture that inspires innovation and discovery.

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