The Mellon College of Science (MCS) has provided the undergraduate training for many of today's leading scientists. We have earned national recognition for our integration of undergraduate education and research from such organizations as the National Science Foundation, the Howard Hughes Medical Institute, and the Beckman Foundation. MCS students gain a broad education in science, mathematics, and the liberal arts while computational approaches in their course, laboratories, and research activities. Our faculty members are committed to teaching as well as to a wide range of scientific research. This combined emphasis on education and research brings special benefits to students, including increased awareness of current scientific developments that are incorporated in classroom instruction, and, most importantly, opportunities to participate with faculty, graduate students, and other research scientists in a variety of research projects.

In the context of rigorous training in each field, the MCS curriculum emphasizes problem-solving, communication, and analytical skills, and it teaches our students the value of hard work and discipline. Our students go on to highly successful careers in a broad range of fields like astrophysics, biotechnology, computer science, business management, environmental science, health care policy, investment banking, marketing analysis, medicine, patent law, and pharmaceuticals. Our alumni credit their education in science for preparing them for a lifetime of learning and achievement; their employers attest to their ability to succeed and to continue learning in an ever-changing world.

The MCS Departments of Biological Sciences, Chemistry, Mathematical Sciences, and Physics each outline their degree programs and courses in the departmental sections. Students select their major in the spring of the first year so that the sophomore year begins with a focus within a department. Most of the courses required within a major are scheduled in the sophomore and junior years, leaving much of the senior year and part of the junior year open for electives. This provides the opportunity to participate in undergraduate research, explore interdisciplinary studies, study abroad, pursue additional majors or minors in other fields, or take other specialty courses oriented toward immediate job placement upon graduation or entry into graduate studies.

Science education in the 21st century demands educational experiences that are much broader than the traditional preparation of a scholar in a chosen field of science. We want our MCS graduates to be engaged professionals who are actively involved and globally engaged, and to grow as persons with a sense of wellness and balance.

With these ambitions in mind, we have set forth fifteen (15) outcomes that all MCS undergraduate students should complete in their time at Carnegie Mellon. Upon graduation, MCS students should be able to:

1. Apply foundational and advanced mathematical and scientific knowledge in a chosen field of study appropriately and fluently to solve complex problems, to integrate concepts across disciplines, and to adapt their knowledge to new situations.
2. Critically assess their current state of knowledge and expertise and acquire new knowledge in pursuit of both specific scientific goals and new intellectual interests broadly within fields of science.
3. Communicate effectively via oral, visual, and written formats with an understanding of the perspectives and expectations of diverse audiences, including those within the discipline and beyond.
4. Participate effectively in multidisciplinary research and/or other teams pursuing complex problems.
5. Use the appropriate tools and required media literacy to acquire, assess, and analyze data and information from diverse sources.
6. Recognize and explain the importance of at least one current research topic in their field.
7. Recognize and explain the similarities and differences in analyzing/approaching problems, including in technical and non-technical fields.
8. Demonstrate knowledge of the arts, humanities, and social sciences.
9. Recognize the interplay of science, society, public policy, business, and economics.
10. Identify global examples of the reciprocal relationships among science, technology, and society.
11. Describe multiple similarities and differences between one's own culture and that of others.
12. Engage in recursive, reflective processes to assess their own levels of physical, emotional, and social wellness and then to choose activities that promote these aspects of wellness.
13. Engage in recursive, reflective processes to balance multiple endeavors by setting priorities and managing time in academic, meta-curricular, and personal dimensions.
14. Recognize ethical issues and appreciate the complexities of interrelationships among them, and the use of information in ethical and legal manners.
15. Articulate how one's own developing skills in science and technology can be increasingly used in constructive ways to address significant contemporary issues, that recognizes the potential impact on local and global issues, including environmental impact and sustainability.

Minors, Double Majors, and Double Degrees
Students are encouraged to pursue additional majors and minors to complement your primary degree, not only within the science college, but also through the other colleges at Carnegie Mellon. Carnegie Mellon offers a variety of options for additional majors and minors, some of which are listed below:

- Interdisciplinary Majors and Minors
- Biological Sciences and Psychology Major
- Computer Science Minor
- Engineering Studies Minor

Here is a sampling of just a few of the interdisciplinary minors and majors offered at Carnegie Mellon. Please see the appropriate sections elsewhere in this catalog for specific descriptions and course requirements.
- Environmental Policy Major
- Health Care Policy and Management Minor
- International Affairs Minor
- Mathematics and Economics Major
- Neuroscience Major and Minor
- Robotics Minor
- Scientific Computing Minor
- Technology and Policy Minor

For a complete list of the minors offered at Carnegie Mellon, please go to Undergraduate Options (http://coursecatalog.web.cmu.edu/servicesandoptions/undergraduateoptions).

University Self-Defined Majors

With a well-thought proposal, you may be able to pursue a major you have designed to meet your particular interests and goals. Please see the catalog section on Undergraduate Options (http://coursecatalog.web.cmu.edu/servicesandoptions/undergraduateoptions).

General Education Requirements

Students pursuing any MCS bachelor’s degree will fulfill the 15 Core Education outcomes through their primary MCS major and by completing the following technical and nontechnical breadth requirements prior to graduation.

Technical Breadth Requirements

As a 21st Century practicing scientist or mathematician, our graduates will work with others from a variety of technical backgrounds. Therefore, all of our students will be broadly trained within the technical fields of science and math. Students will fulfill this training by completing four (4) technical courses in the Science, Technology, Engineering, and Mathematics (STEM) fields at Carnegie Mellon University.

A student must take at least 9 units, outside of their primary major Department, from each of 4 categories listed below. These may include prerequisite courses or courses required by their major Department but must be outside their home Department. AP/IB/Cambridge credit may not be used to fulfill these requirements. At least 3 of these courses must be taken in their first year. The categories are:

A. Life Sciences

(Refer to your specific department for how this category should be fulfilled. Some courses have pre-requisites that can be satisfied by AP, IB, Cambridge A Level Exams. Please check the prerequisites requirements as necessary.)

LIFE SCIENCES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-223</td>
<td>Personalized Medicine: Understanding Your Own Genome</td>
<td>9</td>
</tr>
<tr>
<td>02-261</td>
<td>Quantitative Cell and Molecular Biology Laboratory</td>
<td>9</td>
</tr>
<tr>
<td>03-115</td>
<td>Phage Genomics Research</td>
<td>6</td>
</tr>
<tr>
<td>03-116</td>
<td>Phage Genomics Research</td>
<td>6</td>
</tr>
<tr>
<td>03-121</td>
<td>Modern Biology</td>
<td>9</td>
</tr>
<tr>
<td>03-124</td>
<td>Modern Biology Laboratory</td>
<td>9</td>
</tr>
<tr>
<td>03-125</td>
<td>Evolution</td>
<td>9</td>
</tr>
<tr>
<td>03-127</td>
<td>How Biological Experiments Work - A Project Course</td>
<td>9</td>
</tr>
<tr>
<td>03-133</td>
<td>Neurobiology of Disease</td>
<td>9</td>
</tr>
<tr>
<td>03-161</td>
<td>Molecules to Mind</td>
<td>9</td>
</tr>
<tr>
<td>03-231</td>
<td>Biochemistry I</td>
<td>9</td>
</tr>
<tr>
<td>or 03-232</td>
<td>Biochemistry I</td>
<td>9</td>
</tr>
<tr>
<td>03-250</td>
<td>Introduction to Computational Biology</td>
<td>12</td>
</tr>
<tr>
<td>42-101</td>
<td>Introduction to Biomedical Engineering</td>
<td>12</td>
</tr>
<tr>
<td>42-202</td>
<td>Physiology</td>
<td>9</td>
</tr>
<tr>
<td>85-219</td>
<td>Biological Foundations of Behavior</td>
<td>9</td>
</tr>
</tbody>
</table>

B. Physical Sciences

(Refer to your specific department for how this category should be fulfilled. Some courses have pre-requisites that can be satisfied by AP, IB, Cambridge A Level Exams. Please check the prerequisites requirements as necessary.)

PHYSICAL SCIENCES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-105</td>
<td>Introduction to Modern Chemistry I</td>
<td>10</td>
</tr>
<tr>
<td>09-106</td>
<td>Modern Chemistry II</td>
<td>10</td>
</tr>
<tr>
<td>09-107</td>
<td>Honors Chemistry: Fundamentals, Concepts and Applications</td>
<td>10</td>
</tr>
<tr>
<td>09-214</td>
<td>Physical Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>09-217</td>
<td>Organic Chemistry I</td>
<td>9</td>
</tr>
<tr>
<td>09-219</td>
<td>Modern Organic Chemistry</td>
<td>10</td>
</tr>
<tr>
<td>09-221</td>
<td>Laboratory I: Introduction to Chemical Analysis</td>
<td>12</td>
</tr>
<tr>
<td>09-225</td>
<td>Climate Change: Chemistry, Physics and Planetary Science</td>
<td>9</td>
</tr>
<tr>
<td>09-348</td>
<td>Inorganic Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>33-121</td>
<td>Physics I for Science Students</td>
<td>12</td>
</tr>
<tr>
<td>33-122</td>
<td>Physics II for Biological Sciences &amp; Chemistry Students</td>
<td>9</td>
</tr>
<tr>
<td>33-141</td>
<td>Physics I for Engineering Students</td>
<td>12</td>
</tr>
<tr>
<td>33-142</td>
<td>Physics II for Engineering and Physics Students</td>
<td>12</td>
</tr>
<tr>
<td>33-151</td>
<td>Matter and Interactions I</td>
<td>12</td>
</tr>
<tr>
<td>33-152</td>
<td>Matter and Interactions II</td>
<td>12</td>
</tr>
<tr>
<td>33-211</td>
<td>Physics III: Modern Essentials</td>
<td>10</td>
</tr>
<tr>
<td>33-224</td>
<td>Stars, Galaxies and the Universe</td>
<td>9</td>
</tr>
<tr>
<td>33-225</td>
<td>Quantum Physics and Structure of Matter</td>
<td>9</td>
</tr>
</tbody>
</table>

C. Mathematics, Statistics, and Computer Science

(Refer to your specific department for how this category should be fulfilled. Some courses have pre-requisites that can be satisfied by AP, IB, Cambridge A Level Exams. Please check the prerequisites requirements as necessary.)

MATH, STATS, and CS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>02-201</td>
<td>Programming for Scientists</td>
<td>10</td>
</tr>
<tr>
<td>21-120</td>
<td>Differential and Integral Calculus</td>
<td>10</td>
</tr>
<tr>
<td>21-122</td>
<td>Integration and Approximation</td>
<td>10</td>
</tr>
<tr>
<td>21-124</td>
<td>Calculus II for Biologists and Chemists</td>
<td>10</td>
</tr>
<tr>
<td>21-127</td>
<td>Concepts of Mathematics</td>
<td>10</td>
</tr>
<tr>
<td>21-128</td>
<td>Mathematical Concepts and Proofs</td>
<td>12</td>
</tr>
<tr>
<td>21-228</td>
<td>Discrete Mathematics</td>
<td>9</td>
</tr>
<tr>
<td>21-241</td>
<td>Matrices and Linear Transformations</td>
<td>10</td>
</tr>
<tr>
<td>or 21-240</td>
<td>Matrix Algebra with Applications</td>
<td>10</td>
</tr>
<tr>
<td>or 21-242</td>
<td>Matrix Theory</td>
<td>11</td>
</tr>
<tr>
<td>21-259</td>
<td>Calculus in Three Dimensions</td>
<td>9</td>
</tr>
<tr>
<td>or 21-268</td>
<td>Multidimensional Calculus</td>
<td>9</td>
</tr>
<tr>
<td>or 21-269</td>
<td>Vector Analysis</td>
<td>9</td>
</tr>
<tr>
<td>21-260</td>
<td>Differential Equations</td>
<td>9</td>
</tr>
<tr>
<td>or 21-261</td>
<td>Introduction to Ordinary Differential Equations</td>
<td>10</td>
</tr>
<tr>
<td>36-200</td>
<td>Reasoning with Data</td>
<td>9</td>
</tr>
<tr>
<td>36-201</td>
<td>Statistical Reasoning and Practice</td>
<td>9</td>
</tr>
<tr>
<td>36-202</td>
<td>Methods for Statistics and Data Science</td>
<td>9</td>
</tr>
<tr>
<td>36-217</td>
<td>Probability Theory and Random Processes</td>
<td>9</td>
</tr>
<tr>
<td>36-220</td>
<td>Engineering Statistics and Quality Control</td>
<td>9</td>
</tr>
<tr>
<td>36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
</tr>
<tr>
<td>36-247</td>
<td>Statistics for Lab Sciences</td>
<td>9</td>
</tr>
<tr>
<td>36-309</td>
<td>Experimental Design for Behavioral and Social Sciences</td>
<td>9</td>
</tr>
<tr>
<td>15-110</td>
<td>Principles of Computing</td>
<td>10</td>
</tr>
<tr>
<td>15-112</td>
<td>Fundamentals of Programming and Computer Science</td>
<td>12</td>
</tr>
<tr>
<td>15-122</td>
<td>Principles of Imperative Computation</td>
<td>10</td>
</tr>
<tr>
<td>15-150</td>
<td>Principles of Functional Programming</td>
<td>10</td>
</tr>
<tr>
<td>15-251</td>
<td>Great Ideas in Theoretical Computer Science</td>
<td>12</td>
</tr>
</tbody>
</table>

D. STEM Course

- All of the above courses
- Any Introductory engineering course from CIT
- A STEM course approved by an MCS advisor

Technical Breadth--Departmental Requirements

Some of the majors in MCS require certain courses from the technical breadth requirement that are necessary for either prerequisite knowledge in the major or scientific breadth. For each of the four majors in MCS the Technical Breadth Requirement is completed as follows. If these requirements are met by AP/IB/Cambridge A Level Exams, students can
choose any course from the categories to fulfill the Technical Breadth Requirement.

**Biological Sciences**
1. Life Sciences: any courses in this category except for the 03-XXX courses
2. Physical Sciences: 09-105, 09-106, 33-121 and 33-122
3. Math/CS/Stats: 21-120 and (21-122 or 21-124)
4. STEM Elective: will be filled by courses above or any STEM course from the approved list.

**Chemistry**
1. Life Sciences: 03-121 or 03-231 or 03-232
2. Physical Sciences: 33-121 and 33-122
3. Math/CS/Stats: 21-120 and (21-122 or 21-124)
4. STEM Elective: will be filled by courses above or any STEM course from the approved list.

**Mathematical Sciences**
1. Life Sciences: any courses in this category
2. Physical Sciences: any course in this category
3. Math/CS/Stats: any course in this category except for the 21-XXX courses and 36-200 Reasoning with Data, 36-201, and 36-202
4. STEM Elective: any STEM course from the approved list.

**Physics**
1. Life Sciences: 03-121
2. Physical Sciences: 09-105
4. STEM Elective: will be filled by courses above or any STEM course from the approved list.

**Nontechnical Breadth Requirements**
MCS aspires for all of our undergraduates to leave our campus with a strong sense of personal integrity, social responsibility, ethics, working with diverse others, global engagement, and personal health and well-being. The following non-technical breadth requirements will require students to develop a personalized plan for their course selection and meta-curricular participation to maximize their CMU experience. Our graduates will be well trained to be life-long and life-wide learners that will lead the scientific community and the world at large.

All candidates for MCS bachelor's degrees must complete the following non-technical breadth requirements:

**A. The following three courses must be taken in the first year:**
- 38-101 EUREKA! Discovery and Its Impact 6
- 76-101 Interpretation and Argument 9
- 99-101 Computing @ Carnegie Mellon 3
  or 99-102 Computing @ Carnegie Mellon

**B. The following course must be taken in the Spring of the junior year:**
- 38-301 PROPEL

**C. ENGAGE Courses:**
The ENGAGE courses are self-directed learning opportunities (using the MyCORE online platform) designed to enhance students' engagement with wellness, the arts and community service. Please see the course description for information on when these courses should be taken:

**ENGAGE COURSES**
- 38-110 ENGAGE in Service 1
- 38-220 ENGAGE in the Arts 2
- 38-230 ENGAGE in Wellness: Looking Inward 1
- 38-330 ENGAGE in Wellness: Looking Outward 1
- 38-430 ENGAGE in Wellness: Looking Forward 1

**D. Cultural/Global Understanding Course:**
Cultural or global understanding course(s) may be taken at any time. Nine (9) or more units from the following group of courses will fulfill this requirement. Any student who finds an appropriate Carnegie Mellon course not on the list below that might fulfill this requirement should contact their academic advisor to review the course description to determine if it can be substituted. Cultural and global understanding courses that are taken while studying abroad can be used to fulfill this category. In addition, transfer courses will also be considered for this category. However, this course requirement cannot be satisfied with AP/IB/Cambridge exam credit.

**CULTURAL/GLOBAL UNDERSTANDING**
- 57-173 Survey of Western Music History 9
- 57-209 The Beatles 9
- 57-306 World Music 9
- 70-342 Managing Across Cultures 9
- 73-331 Political Economy of Inequality and Redistribution 9
- 76-221 Books You Should Have Read By Now 9
- 76-227 Comedy 9
- 76-232 Introduction to African American Literature 9
- 76-239 Introduction to Film Studies 9
- 76-241 Introduction to Gender Studies 9
- 76-386 Language & Culture 9
- 79-104 Global Histories 9
- 79-201 Introduction to Anthropology 9
- 79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
- 79-205 20th/21st Century Europe 9
- 79-207 Development of European Culture 9
- 79-221 Development and Democracy in Latin America 9
- 79-229 Origins of the Arab-Israeli Conflict, 1880-1948 9
- 79-230 Arab-Israeli Conflict and Peace Process since 1948 9
- 79-240 Development of American Culture 9
- 79-241 African American History: Africa to the Civil War 9
- 79-242 African American History: Reconstruction to the Present 9
- 79-255 Irish History 9
- 79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
- 79-265 Russian History: From the First to the Last Tsar 9
- 79-266 Russian History: From Communism to Capitalism 9
- 79-275 Introduction to Global Studies 9
- 79-297 Dilemmas and Controversies in Anthropology 9
- 79-307 Religion and Politics in the Middle East 9
- 79-345 Roots of Rock & Roll 9
- 79-349 The Holocaust in Historical Perspective 9
- 79-350 Early Christianity 9
- 79-357 History of Black American Music 6
- 80-100 Introduction to Philosophy 9
- 80-250 Ancient Philosophy 9
- 80-251 Modern Philosophy 9
- 80-253 Continental Philosophy 9
- 80-254 Analytic Philosophy 9
- 80-255 Pragmatism 9
- 80-276 Philosophy of Religion 9
- 82-xxx Any course from Modern Languages 9
- 99-241 Revolutions of Circularity 9
- 99-3xx Any of the Country Today courses 3

**E. Arts, Humanities, and Social Sciences Courses**
To fulfill this requirement, students must complete a minimum of four (4) nontechnical courses totaling at least 36 units in the College of Fine Arts, the Tepper School of Business and/or the Dietrich College for Humanities and Social Sciences. A maximum of 18 units of these units may be fulfilled via AP/IB/Cambridge exam credit. Courses counted toward the Cultural/Global Understanding requirement, and 76-101, do not count toward this requirement.

**NOTE:** Check our web site for courses from DC, CFA, and Tepper that may NOT be used (http://www.cmu.edu/mcs/undergrad/advising/hss-finearts/deletions.html) to satisfy this requirement because they are too technical in nature, plus a list of courses in other colleges (including SCS, CIT, Tepper, and Heinz College) that do satisfy (http://www.cmu.edu/mcs/undergrad/advising/hss-finearts/additions.html) this requirement.

For students entering in the Fall of 2015 and beyond, the following requirements apply to all MCS bachelor’s degrees:

1. Students must complete a minimum of 360 units.
Honors Degree Programs in MCS

Several of the departments in MCS offer students an opportunity to participate in a departmental honors degree program. Some of these programs result in a master’s degree along with the bachelor’s degree (see next section on accelerated master’s programs). These programs are listed below; see the department’s section of the catalog for more details.

- Honors Program in Research Biology
- Departmental Honors in Chemistry
- Honors B.S./M.S. Program in Chemistry
- Honors B.S./M.S. Program in Mathematical Sciences

Accelerated Master’s Programs

Carnegie Mellon offers some accelerated master’s programs for motivated students, whereby students complete both the bachelor’s and the master’s degree in four or five years. Some programs are in the student’s home department in MCS as part of an honors program, while others are offered through one of our graduate schools at Carnegie Mellon. Below is a listing of the programs currently available to MCS students; please see the appropriate sections of the catalog for more details.

- Honors B.S./M.S. Program in Chemistry
- Honors B.S./M.S. Program in Mathematical Sciences
- Accelerated Master’s Program in the Heinz College

Study Abroad

There are many programs for studying abroad, usually during your junior year. Please see the catalog section on Undergraduate Options for more details, and talk with the Office of International Education to get information and advice specifically for you.

Pre-Professional Programs

Many students in the Mellon College of Science decide to pursue professional training such as medical school or law school after completing their undergraduate work. Carnegie Mellon offers strong advising services to support these students. Through these programs, students get help with everything from course selection to identification of important experiential opportunities to the application process itself.

Health Professions Program

Faculty Contact: Jason D’Antonio

Please see the Undergraduate Options (http://coursecatalog.web.cmu.edu/servicesandoptions/undergraduateoptions/#healthprofessionsprogram) section for details on the Health Professions Program.

Pre-Law Advising Program

Faculty Contact: Joseph Devine

Please see the Undergraduate Options (http://coursecatalog.web.cmu.edu/servicesandoptions/undergraduateoptions/#pre-lawadvisingprogram) section for details on the Pre-Law Advising Program.

Intercollege Programs

MCS participates in two intercollege programs, the Bachelor of Science and Arts Degree program and the Science and Humanities Scholars program. Enrollment for the Science and Humanities program is by invitation only for incoming first-year students, and by application for current students.

Bachelor of Science and Arts Degree Program (BSA)

Students in the Bachelor of Science and Arts Degree program are jointly admitted to MCS and the College of Fine Arts (CFA). This is a degree program for students who are naturally gifted in both the arts and the sciences, and allows for the combining of talents in these areas. More details can be found at http://coursecatalog.web.cmu.edu/servicesandoptions/intercollegeprograms/bsaintercollege/.

Science and Humanities Scholars Program (SHS)

Students in the Science and Humanities Scholars Program (SHS) are jointly admitted to MCS and the Dietrich College of Humanities and Social Sciences (DC). Participants in this program follow a special general education core, but have the flexibility to choose a primary major in either of the two colleges. More detail can be found at http://coursecatalog.web.cmu.edu/servicesandoptions/intercollegeprograms/.

Applying Your Education Through Research

An important feature of education in MCS is the opportunity for undergraduate research experience. This experience may be arranged as a course taken for credit or occasionally as a part-time job. Our web site (www.cmu.edu/mcs/) offers a range of useful information including links to faculty research areas, links to undergraduate research programs at other institutions, and ideas on how to get involved. Because of the strong research base of MCS, undergraduate research positions offer an exciting opportunity to apply your theoretical training to participate in the discovery of new knowledge.

Students can earn MCS Research Honors for significant research accomplishments; see the policy outlined below for the requirements.

Mellon College of Science Research Honors

Undergraduates in the Mellon College of Science will be awarded MCS College Honors at the completion of their degree if they have met one of these requirements:

1. Successfully completed the Honors BS/MS program in the Department of Chemistry or Department of Mathematical Sciences.
2. Successfully completed the departmental honors program in the Department of Biological Sciences or the Department of Chemistry.
3. Earned a cumulative grade point average of 3.20 or higher and carried out significant research. Typically, this would consist of an academic project carried out for at least two semesters. However, a single project that spans a summer and a semester or that the research mentor deems to be significant and sustained, even if the student worked for pay rather than credit, will be allowed. In addition, some form of public dissemination of this research, which has been approved by the Associate Dean of MCS, such as a peer-reviewed publication, research thesis, or presentation at an external scientific meeting is required. The Meeting of the Minds by itself is not sufficient and participation in a preapproved judged competition, such as Sigma Xi, is necessary.

Final approval of nominations for MCS Honors will come from the Dean of MCS and the Associate Dean for Undergraduate Affairs.

Research Centers

The Mellon College of Science is home to a number of innovative research centers. These centers are particularly strong because of the interdisciplinary collaboration of their scientists. This interdisciplinary research brings international prestige to the college. Many students conduct undergraduate research with one of these centers.

The Bruce and Astrid McWilliams Center for Cosmology joins research efforts in astrophysics and particle physics and partners with computer science, statistics, and other disciplines to unravel the mysteries of the universe.

The Center of Atmospheric Particle Study’s goal is to be the world leader in environmental policy related to particulate matter.
The action of probation will be taken if:

- Probation suspend or drop a student without prior probation.
- An academic action. For all subsequent semesters an academic action will invoke an academic action.

In the first year, quality point averages below 1.75 in either semester invoke an academic action. The student must earn a quality point average of at least 3.75 while completing a minimum of 36 factorable units and earning no incomplete grades.

Academic Standards

Academic Actions

MCS Dean’s List

Each semester MCS recognizes those students with outstanding academic records by naming them to the Dean’s List. The criteria for such recognition are as follows:

- **Dean’s List**
  - The student must earn a quality point average of at least 3.5 while completing a minimum of 36 factorable units and earning no incomplete grades.

- **Dean’s List High Honors**
  - The student must earn a quality point average of at least 3.75 while completing a minimum of 36 factorable units and earning no incomplete grades.

Probation, Suspension, and Drop

In the first year, quality point averages below 1.75 in either semester invoke an academic action. For all subsequent semesters an academic action will be taken if the semester QPA or the cumulative QPA (excluding the first year) is below 2.00.

The progression below probation, suspension, and drop is typical. However, in unusual circumstances, MCS College Council may choose to suspend or drop a student without prior probation.

Probation

The action of probation will be taken if:

- One semester of the first year is below 1.75 QPA.
- The semester QPA of a student in good standing beyond the first year falls below 2.00. The term of probation is one semester as a full-time student. First-year students are no longer on probation at the end of the second semester if their semester QPA is 1.75 or above.

A student is occasionally continued on probation who has had one semester on probation and is not yet meeting minimum requirements but whose record indicates that the standards are likely to be met at the end of the next semester of study.

Suspension

A student who does not meet minimum standards at the end of one semester of probation will be suspended.

A first-year student will be suspended if the QPA from each semester is below 1.75.

A student in the third or subsequent semester of study will be suspended if the semester factor or the cumulative factor (excluding the first year) is below 2.00 for two consecutive semesters.

The minimum period of suspension is one academic year (two semesters). At the end of that period a student may return to school on probation by:

- Receiving permission in writing from the Associate Dean of MCS.
- Completing a Return from Leave form from Enrollment Services.
- Providing transcripts and clearance forms if the student has been in a degree program at another college or university, even though academic credit earned will not transfer to Carnegie Mellon unless prior approval has been granted by the Associate Dean.

Employment within the university in non-student jobs is possible for students on academic suspension, subject to the hiring criteria of the hiring department. However, a student on academic suspension wishing to accept a job on campus must speak with the Associate Dean of the student’s college to ensure that the employment will not constitute a violation of the terms of suspension. The Associate Dean will generally allow such employment, in consultation with the Dean of Student Affairs. One employment benefit not available to students on academic suspension who accept a full-time job with the University is the option to take courses through tuition remission. The option to take courses becomes available only after the academic suspension is over.

Drop

This is a permanent severance from the Mellon College of Science. Students are dropped when it seems clear that they will never be able to meet minimum standards. A student who has been suspended and who fails to meet minimum standards after returning to school is dropped.

A student who has been academically dropped or academically suspended and who is not employed by the University must absent themselves from campus and is, for the term of the suspension, barred from all activities and affiliations that stem from one’s status as an enrolled student. These include registering or enrolling for courses, sitting in on classes, living in residence halls or Greek houses, membership and participation in student activities, and employment in student jobs. (NOTE: Exceptions to the restriction from student jobs for students on academic suspension will in general be granted for summer employment if the position was accepted prior to the decision to suspend.)

Transfer into MCS Departments

Undergraduate students admitted to MCS can choose to pursue any major within MCS. This choice must be made prior to the first semester of the sophomore year (normally during the second semester of the first year) and does not require approval by any department.

Undergraduate students admitted to colleges other than MCS and wishing to transfer into an MCS department during their first year should consult with the MCS Associate Dean for Undergraduate Affairs. Students may submit an internal transfer request no earlier than mid-term of the spring semester of the first year. Potential transfer students must also have successfully taken 21-120 Differential and Integral Calculus and, depending on major choice, one of the following: 03-121 Modern Biology, 09-105 Introduction to Modern Chemistry I, or 33-111 Physics I for Science Students.

MCS undergraduate students beyond the first year wishing to transfer into another MCS department may do so if they are not on academic probation and if there is room in the department of their choice. If the demand for any department exceeds the space available, then the department will admit students based on a comparative evaluation of all applicants at the end of each semester, up to the limit of available space.

Undergraduate students not in MCS and wishing to transfer into a department in MCS beyond the first year will be considered for transfer on a space available/academic performance basis. An MCS department may refuse a transfer to a non-MCS student if there are space restrictions and/or
if the student’s chance for success is determined to be questionable based on past academic performance.

Procedure for transfer of students from another university into an MCS department:

A student first applies through the Office of Admission. If the Office of Admission believes the applicant is acceptable, the student’s record is sent to the appropriate department for evaluation and a decision on acceptance. The MCS department head has the right to refuse to accept the student if there are space restrictions and/or if the student’s chance for success in the MCS department is determined to be questionable based on past academic performance.

Graduation Requirements

To be eligible to graduate, undergraduate students must complete all course requirements for their program with a cumulative Quality Point Average of at least 2.0 for all courses taken. For undergraduate students who enrolled at Carnegie Mellon as freshmen and whose freshman grades cause the cumulative QPA to fall below 2.0, this requirement is modified to be a cumulative QPA of at least 2.0 for all courses taken after the freshman year. Note, however, the cumulative QPA that appears on the student’s final transcript will be calculated based on all grades in all courses taken, including freshman year. Some programs may have additional QPA requirements in order to graduate. Students are encouraged to confirm all graduation requirements with their academic advisor.

A minimum of 360 units must be completed. This will include the MCS Technical and Nontechnical Core Courses and all departmental course requirements.

Students will be required to meet the residency requirement and to have met all financial obligations to the university before being awarded a degree. The residency requirement is detailed in the Academic Regulations section of the catalog. A student may seek permission to modify graduation requirements by petition to the MCS College Council.

Graduation Honors

There are two types of honors awarded at graduation.

University Honors

University Honors are automatically awarded to students who have earned a cumulative Q.P.A. of 3.5 or better after seven semesters.

College Research Honors

Please see the section “Mellon College of Science Research Honors” for information on how to qualify for College Research Honors.

Faculty

WILLIAM ALBA, Assistant Dean for Diversity, Director of Science and Humanities Scholars Program – Ph.D.,

MAGGIE BRAUN, Associate Dean for Undergraduate Affairs – Ph.D.,

JASON D’ANTONIO, Director of Health Professions Program – Ph.D.,

KENNETH HOVIS, Assistant Dean for Educational Initiatives – Ph.D.,

CURTIS MEYER, Associate Dean for Faculty and Graduate Affairs – Ph.D.,

Administration

CHARLOTTE BARTOSH, Interdisciplinary Laboratory Research Technician.

CHRISTINE GILCHRIST, Senior Academic Coordinator, MCS.

VERONICA PEET, Senior Academic Advisor, Science and Humanities Scholars Program.

TARA PRIMIERO, Administrative Coordinator.

MAY SIMAAN, Administrative Coordinator.