Science - General Information

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Historical Note

Since its establishment as a separate school of Manhattan College in 1993, the School of Science has maintained its traditional ties with the School of Liberal Arts while striving to assure the continuation of Manhattan's tradition of excellence in education in Science. This tradition is reflected in the success of Manhattan's Science graduates and the position of Manhattan among a select number of colleges which are recognized as important sources of the nation's professional scientists.

Mission Statement

The mission of the School of Science is to help our students to see, to know and so, to act.

To see the invisible world through the lens of a microscope or telescope; to see in the extended laboratory of New York City the problems, opportunities and rich culture of urban life; to see — with a global perspective — the world grown both smaller through communications and more complex through cultural differences; and to see their place and responsibilities in a world of conflicting moral and ethical claims: this is our mission.

To know by developing the skills of critical thinking and clear writing and speaking; to know by acquiring the research techniques to find information rapidly and efficiently; to know in cooperation with teachers who pay individual attention to students; to know not only the network of the core curriculum with courses in humanities, natural science, behavioral and social science; and to know not only the how, but also the why: this is our mission.

And finally, to act, to do, to follow in a long line of Manhattan graduates who have made a difference in a wide variety of careers in the public as well as the private sector, and to bring into the world of the future a sense of integrity, honesty and values supported and strengthened at Manhattan College: this is our mission.

Curriculum and Programs

Undergraduate studies in the Sciences are most challenging, but provide a unique opportunity to learn and develop problem-solving and analytical skills while gaining a deeper understanding and appreciation of physical laws and their applications. The choice of a Science major is based upon the individual’s interests, educational and career goals, and abilities. Majors may be chosen from several areas: biology, biochemistry, chemistry, computer science, environmental science, mathematics, and physics. Elective components of the major curricula provide the opportunity to explore other areas of interest, enhance knowledge in a specialized area of the major, or construct minor sequences in other disciplines. Minors may be earned in all of the departments of the School of Science. At Manhattan, our Science curricula contain a strong core component in the Liberal Arts to provide a foundation for our graduates to contend with the humanistic
and ethical issues they will face after graduation. Once a student is admitted to Manhattan College, all major, minor, and core courses should be taken at Manhattan College. Under unusual circumstances, and with the approval of the Dean after consultation with the Chair of the student’s major department, courses may be approved to be taken at another institution.

A minimum grade of C is necessary in any course used to satisfy major or minor requirements.

**Major Fields of Study**

The School of Science provides the seven major fields of study that are listed below.

- Biochemistry
- Biology
- Chemistry
- Computer Science
- Environmental Science
- Mathematics
- Physics

The School of Science is unique among the five traditional undergraduate schools in that it offers each of its majors in a Bachelor of Science track as well as a Bachelor of Arts track. Although program differences will vary from major to major, the Bachelor of Arts track is generally less restrictive allowing greater flexibility for students pursuing a second major or minors.

**Second Majors**

By carefully constructing their plan of study, students can pursue a second major either within the School of Science or in any discipline in the other schools in Manhattan College. Students wishing to complete a second major must complete the requirements for both majors. Pursuing a second major might require taking courses during the summer and/or additional expense. If you are interested in doing a second major, please consult with the Assistant Dean.

**Minor Fields of Study**

In order to provide an opportunity for students to broaden their educational experiences, students in Manhattan College are able to minor in any of the areas listed above under Major Fields of Study. Minors in the School of Science consist of a minimum of fifteen credits in the discipline. Details of these programs may be found under the separate headings for each department in the School of Science.

Science students who are interested in pursuing a minor outside the School of Science must contact the chair of the respective department for further information.
Program Concentrations

In addition to the regular course of study, the seven programs of study in the School of Science deliver focused instruction in subjects of contemporary interest such as:

- Applied Mathematics
- Environmental Biology
- Machine Learning & Intelligence
- Nanoscience
- Theoretical Physics
- Pre-Health Concentration

School of Science Curriculum

To complete their degree, students in the School of Science have various requirements broken down into different categories: Orientation Seminar, Liberal Arts Core, Cognate Requirements, Major Requirements, and Free Electives. If a student elects to do a minor then they would also have Minor Requirements.

The Orientation Seminar is the same for all majors in the School of Science and consists of SCI 100 Science Orientation Seminar I and SCI 101 Science Orientation Seminar II.

The Liberal Arts Core is generally the same for all majors in the School of Science and consists of the courses listed below. The Cognate Requirements, Major Requirements, and Free Electives vary from major to major. These requirements can be found under each department.

Liberal Arts Core Requirements

College Writing (ENGL 110 First Year Composition or ENGL 210 Advanced First Year Composition) 3
Religious Studies (three courses in RELS) 1 9
Modern Language (a full year requirement of the same language) 6
ENGL 150 Roots: Literature 3
HIST 150 Roots: History 3
PHIL 150 Roots: Philosophy 3
One of the following: 3
LLRN 102 Classical Origins: West Culture
PHIL 213 Introduction to Logic
PHIL 214 Critical Thinking
One of the following: 3
ART 150 Roots: Art
MUSC 150 Roots: Music
Two of the following social sciences: 6
ECON 150 Roots: Economics
POSC 150 Roots: Government
SOC 150 Roots: Sociology
PSYC 150  Roots: Psychology

<table>
<thead>
<tr>
<th>Total Credits</th>
<th>39</th>
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</thead>
<tbody>
<tr>
<td>1  RELS 110 The Nature and Experience of Religion, a 200 level RELS course in Catholic Studies, an upper level RELS course in Global Studies or Contemporary Issues.</td>
<td></td>
</tr>
</tbody>
</table>

Science Honors Program

The School of Science Honors Program is designed to provide talented, highly qualified, and highly-motivated science and mathematics undergraduate students with an enriching experience that develops rigorous and cutting-edge scientific skills, select opportunities with top research faculty, leaders, and mentors, and exposure to and lived experience with Lasallian values.

Students with majors in the School of Science are accepted into the Honors Program based on academic performance, involvement in extracurricular activities, and potential for leadership and scholarship. They join a community of students who are focused on academic and leadership achievement. They enter a curriculum designed to enhance their science and interpersonal skills through seminar-style core classes, specialized major courses, and a senior capstone research experience/thesis. Additional career-related networking activities are also offered.

The curriculum consists of at least 21 credits of Honors courses (at least 7 courses) to be taken over 4 years at Manhattan College. Please note that the Honors courses are enriched versions of courses in a student’s program of study and are not additional courses. At least two of those Honors courses must be outside the student’s major, one of which may be outside the School of Science. The remaining courses will be in the major and will include at least 3 credits of Honors Thesis in the senior year. Each student will give a presentation on their thesis. All students must maintain a cumulative GPA of at least 3.5 at Manhattan College to remain in the program.

For more information on the School of Science Honors Program, visit our website at: School of Science Honors Program (https://manhattan.edu/academics/schools-and-departments/school-of-science/School-of-Science-Honors-Program.php).

Academic Advising

Academic advisement for students in Science is conducted by the Assistant Dean in conjunction with the Department Chairs and faculty. The Assistant Dean counsels all students throughout their academic career on not only policy and procedures, but any challenges - personal and academic - that may arise in a student’s time at the College. All students should select their major by the end of their freshman year. Programs of study are approved each semester by the Assistant Dean. Additionally, Department Chairs and faculty are responsible for advising all students in their majors. The faculty are closely associated with professional organizations and industrial groups carrying out related activities, thus assuring maximum service to the student in preparing to meet the requirements for the degree, for advanced professional study, and for career placement.
Science students who plan to enter graduate health professions programs should consult with the Pre-Health Professions Advisor. The Advisor will guide the students through the preparation and application process required for medical school admission.

**Study Abroad**

Students interested in studying abroad should discuss their interest with the Assistant Dean by the beginning of sophomore year. Students may opt to study abroad for either a full semester or on one of the College’s short-term programs during the winter intersession or summer break. If planning to go abroad for a full semester, it is best to plan the semester of study abroad for the sophomore or junior year. Further information about study abroad opportunities is available through the Study Abroad Office.

**Honor Societies and Research Opportunities**

A number of national honor societies have been established on campus in order to encourage and recognize the achievements of Manhattan College students.

Phi Beta Kappa, founded in 1776, is dedicated to the idea of excellence in the liberal arts and sciences. The Manhattan College chapter, The Upsilon of New York, was established in 1971. Election to Phi Beta Kappa is generally regarded as a mark of the highest distinction.

Sigma Xi is a national honor society founded in 1896 to encourage research in the sciences. Students are elected to membership on the basis of their accomplishments in research and their enthusiasm for continued scientific investigation.

Departments of the School of Science sponsor local chapters of national honor societies in their disciplines: Beta Beta Beta (Biology), Gamma Sigma Epsilon (Chemistry and Biochemistry), Tau Sigma Kappa (Computer Science), Pi Mu Epsilon (Mathematics), Sigma Pi Sigma (Physics), and Alpha Epsilon Delta (Health Pre-Professional).

The Science faculty are dedicated to encouraging student research efforts. Manhattan’s small classes and close student-faculty interactions generate an atmosphere which has produced many important student-faculty research collaborations. Every summer over thirty students receive financial support to conduct research with their faculty on campus. The students’ research is presented in regional and national conferences and leads to published papers in *The Manhattan Scientist* (https://issuu.com/ctheodo21/docs/) and in professional journals.

**Professional and Career Development**

**Prelegal Advisory Committee**

While there is no single major or minor here at Manhattan College that is a prerequisite for applying to law school, students who do well in the application process have strong analytic and problem-solving skills, critical reading skills, writing skills, communication skills, research skills, task management skills and a dedication to public service and promotion of justice, according to the American Bar Association. It is important to work with the pre-law advisors throughout the undergraduate process in order to be prepared for the law school application process. Contact the Center for Graduate and
Fellowship Advisement in Thomas Hall 3.50, 718-862-7399, gsfa@manhattan.edu, for more information.

**Health Professions Advisory Committee**

The Health Professions Advisory Committee is a body of faculty members who give guidance to students interested in preparing for careers in medicine, dentistry, and allied health fields. Students are advised of the requirements established by the Association of American Medical Colleges, the American Dental Association, and other professional associations in the health fields.

**Preparation for Medicine and Dentistry**

Students preparing for professional school admission may major in any discipline in the College. Their preparation must include, at a minimum, the following courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BIOL 111</td>
<td>General Biology I</td>
<td>8</td>
</tr>
<tr>
<td>&amp; BIOL 112</td>
<td>and General Biology II</td>
<td></td>
</tr>
<tr>
<td>BIOL 113</td>
<td>General Biology I Laboratory</td>
<td>0</td>
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<tr>
<td>&amp; BIOL 114</td>
<td>and General Biology II Laboratory</td>
<td></td>
</tr>
<tr>
<td>CHEM 101</td>
<td>General Chemistry I</td>
<td>6</td>
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<tr>
<td>&amp; CHEM 102</td>
<td>and General Chemistry II</td>
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<tr>
<td>CHEM 103</td>
<td>General Chemistry Laboratory I</td>
<td>2</td>
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<tr>
<td>&amp; CHEM 104</td>
<td>and General Chemistry Laboratory II</td>
<td></td>
</tr>
<tr>
<td>CHEM 319</td>
<td>Organic Chemistry I</td>
<td>6</td>
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<tr>
<td>&amp; CHEM 320</td>
<td>and Organic Chemistry II</td>
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<tr>
<td>CHEM 323</td>
<td>Organic Chemistry Laboratory I</td>
<td>4</td>
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<tr>
<td>&amp; CHEM 324</td>
<td>and Organic Chemistry Laboratory II</td>
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</tr>
<tr>
<td>A Biochemistry Course</td>
<td>3</td>
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<tr>
<td>BIOL 319</td>
<td>Cellular BioChemistry/Physiology</td>
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<tr>
<td>or CHEM 433</td>
<td>Biochemistry I</td>
<td></td>
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<tr>
<td>ENGL 110</td>
<td>First Year Composition</td>
<td>3</td>
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<tr>
<td>Two Semesters of Calculus</td>
<td>6</td>
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<tr>
<td>or a Semester of Calculus and a Statistics Course</td>
<td>2</td>
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<tr>
<td>A two-term Physics Sequence</td>
<td>8</td>
<td></td>
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<tr>
<td>PHYS 101</td>
<td>Physics I</td>
<td></td>
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<tr>
<td>&amp; PHYS 102</td>
<td>and Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 191</td>
<td>Physics I Lab</td>
<td></td>
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<tr>
<td>&amp; PHYS 192</td>
<td>and Physics II Lab</td>
<td></td>
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<td>or</td>
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</tr>
<tr>
<td>PHYS 107</td>
<td>Introduction to Physics I</td>
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<tr>
<td>&amp; PHYS 108</td>
<td>and Introduction to Physics II</td>
<td></td>
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<tr>
<td>PHYS 197</td>
<td>Introduction to Physics I Lab</td>
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<tr>
<td>&amp; PHYS 198</td>
<td>and Introduction to Physics II Lab</td>
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</tbody>
</table>

1 (MATH 185 Calculus I and MATH 186 Calculus II) or (MATH 155 Calculus for the Life Sciences I and MATH 156 Calculus for the Life Sciences II)
(MATH 185 Calculus I or MATH 155 Calculus for the Life Sciences I) and MATH 230 Elementary Statistics

At least two courses in English is a requirement for all medical schools and at least one course each in Psychology, Sociology, and Genetics (BIOL 217 Genetics) are highly recommended by all medical schools. Pre-professional students are expected to maintain an average of at least B in their science courses.

For additional information see the Pre-Health Concentration (https://catalog.manhattan.edu/undergraduate/science/prehealth/) section of the catalog.