College of St. Benedict
St. John’s University
Natural Science Major
CSB/SJU Natural Science Major

The Natural Science major provides both breadth and depth in the sciences. After an initial exposure to four different disciplines at the introductory level, students are encouraged to focus in one area for their upper division study. A total of 64 credits in the major are required for graduation. Students have the opportunity to select courses from astronomy, biology, biochemistry, chemistry, computer science, environmental studies, geology, mathematics, nutrition, and physics. A detailed listing of requirements as it appears on pages 106 and 107 in the 2005-2007 course catalog follows the pictures. This information is also available at


A frequent reason given for choosing natural science is the freedom and versatility that the major offers. Furthermore, the major allows students to see the connections among the sciences more clearly.
A natural science major combined with a minor in secondary education is recommended for students interested in teaching science in grades 5-12. This major also appeals to students desiring to pursue careers in research and health related fields. About 25% of natural science majors continue their education in graduate and professional schools.

Our alumni have found employment in the following sectors: agriculture, astronomy, athletic training, biomedical engineering, dentistry, environmental law, environmental studies, exercise physiology, geology, industrial research, medicine, optometry, paleontology, pharmacy, physician’s assistant and physical therapy. Most of the prerequisites required by professional and graduate schools in these areas can be counted toward the major. One alumnus writes “The Nat. Sci. Major was perfectly catered toward pre-professional students and helped prepare for the intense dental school curriculum." Another one puts it this way "It seems most colleges don't offer a major like Natural Science which is unfortunate. It is a perfect major for the health professions. Once requirements are met students have a great amount of freedom in exploring any area of science that may interest them." 

As a natural science major, you may select an advisor from any of the departments pictured on the following pages and enroll in courses offered by these departments.
# Four-Year Plan

## First Year

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<tr>
<th>Fall Term</th>
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<td>1. First Year Symposium 100</td>
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<td>3. Math 100</td>
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## Junior

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## Senior

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Natural Science: Catalog Description
Divisional Head: Frank Rioux

The natural science major is designed to accommodate the student's broader interest in the areas of science. This major is appropriate for students desiring to continue their education in a variety of science or medically-related fields. These fields include the health professions, teaching at various levels, agricultural and environmental pursuits, law, economics, geology, government positions, industrial research and other opportunities. The exact sequence of studies must be chosen carefully in consultation with an appropriate faculty advisor in the natural sciences.

Assessment
Natural Science majors are required to complete an online survey when they apply to the major and a follow-up survey during their senior year. They are also required to take the major field test in their area of concentration during the last semester of their senior year.

Major
The natural science major offers concentrations in natural science and natural science/secondary education. Students need to fulfill the mathematics proficiency requirement before they can be admitted to the major.
Biology Greenhouse

Biochemistry Laboratory
Chemistry Laboratory

Computer Science Laboratory
Environmental Studies Laboratory

Geology Laboratory
Poster Presentations

Mathematics Laboratory/Lecture
Concentration in Natural Science (64 credits*)
Required Courses:

Two courses (8 credits) from each of four of the following areas:

- ASTR 211, 212;
- BIOL 121, 221, or 222;
- CHEM 123, 234;
- CSCI 150, 160;
- GEOL 211, 212; or 213, 214;
- MATH 119 or 123 (not both), 120, 124;
- PHYS 105, 106 or 191, 200.

Eight additional 4-credit courses, or the equivalent from biology, chemistry, computer science, geology, mathematics or physics; five of the eight courses must be upper division. NUTR 125, 330, 331 and ENVR 175, 275 may be selected to fulfill up to three of the eight courses.

The only 100-level science courses that may be used to fulfill a requirement for this concentration are listed above. It is not possible to major in both natural science and another science.
Special Requirements:

*For the "three-one" program in dentistry (see listing under "Pre-Professional Programs"), the requirements for a natural science major will be fulfilled by meeting the lower-division requirements in biology, chemistry, physics and one course in mathematics plus, CHEM 235, 236; a minimum of two upper-division science electives; and credits from the first year of professional school (when transferred back to Saint Benedict's or Saint John's).
Suggestions:

Students whose interests lie primarily in biology and chemistry should begin with BIOL 115, 116 and CHEM 123, 234. If inclined toward a physics concentration, students should begin with PHYS 191, 200 and MATH 119, 120.

Concentration in Natural Science/ Secondary Education

This program is designed for students interested in teaching science at the secondary (grades 5-12) level. This course sequence must be combined with a minor in secondary education. Majors should contact the education department early in their college career for advice on licensing requirements.

Students are advised that a program in natural science fulfilling Minnesota licensure academic requirements may require a ninth semester, course overloads and/or summer school. Consult Frank Rioux (Natural Science) or the Education Department for the approved program.
Suggestions:

Science Requirements for all Licensure Areas (5-8 and 9-12) (32-36 credits)
- BIOL 121, 221, or 222
- CHEM 123 and 234
- ASTR 211 or 212 (212 recommended)
- GEOL 211 or 212 or 213 or 214
- PHYS 105 and 106 or 191 and 200

Suggested mathematics courses:
- MATH 119 or 123 or 124

Education Requirements for all Licensure Areas (5-12)
- EDUC 109, 111, 203, 213, 310, 355, 358, 359, 362, 390

First Aid/CPR Certification and fulfillment of speech requirement.
Course Selection

Biology 9-12 (20 credits)
(Total: 52 credits)
32 credit core plus
BIOL 200 Biological Information (1)
BIOL 305 Invertebrate Zoology (4) or
    BIOL 306 Plant Diversity (4) or
    BIOL 307 Biology of Microorganisms (4)
BIOL 316 Genetics (4)
BIOL 339 Evolution (4)
BIOL 334 General Ecology (4) or BIOL 336
    Behavioral Ecology (4) or BIOL 337
    Aquatic Ecology (4)
BIOL 323 Animal Physiology or BIOL 327
    Plant Physiology (4)
Course Selection

Chemistry 9-12 (21 credits)
(Total: 53 credits)
32 credit core plus
CHEM 235 Organic Chemistry I (4)
CHEM 236 Organic Chemistry II (4)
CHEM 320 Chemical Literature (1)
CHEM 335 Analytical Chemistry (4)
8 additional credits in chemistry
Course Selection

Physics 9-12 (28-29 credits)
(Total: 60-61 credits)
24 credit core plus
PHYS 191 and PHYS 200 from the core area
PHYS 211 Foundations of Physics III (4)
PHYS 217A Digital Electronics (2)
PHYS 320 Modern Physics (4)
PHYS 332 Intermediate Physics Laboratory
   (0-1) (2 semesters)
MATH 119 Calculus I (4)
MATH 120 Calculus II (4)
MATH 239 Linear Algebra (4)
MATH 337 Differential Equations (4)
# Core Requirements

## Check List

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Natural Science Major

2 courses from 4 areas:

___ASTR 211    ___ASTR 212
___BIOL 121    ___BIOL 221    or    ___BIOL 222
___CHEM 123    ___CHEM 234
___CSCI 150    ___CSCI 160
___GEOL 211 (213) ___GEOL 212 (214)
___PHYS 105 (191) ___PHYS 106 (200)
___MATH 119 (123) ___MATH 120 (124)

8 additional 4 credit courses from BIOL, CSCI, CHEM, ENVR (175, 275), MATH, PHYS, NUTR (125, 330, 331), 5 must be upper division

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For more information about the Natural Science major visit http://www.csbsju.edu/catalog/2005_2007/departments/natural_science.htm or contact: Frank Rioux, Head, Natural Science Division, ASC 241, CSB; frioux@csbsju.edu
Erin Saupe had no aspirations of becoming a science major when she enrolled at CSB/SJU. However, her future soon changed when she took an introductory geology course her first semester at college. “I knew I found something I was passionate about,” Saupe said. “The professor pulled me into the subject matter and made the everyday world fascinating.”

As a Natural Science major, Saupe has had the opportunity to study topics in geology as well as environmental studies, biology and chemistry. She has participated in many research projects, including analyzing the oil and gas reserves of the Gulf Coast with the United States Geological Survey and working on a dinosaur dig during summer field research in Montana. Saupe has presented her research at two National Geological Society of America meetings as well as participated in Posters on the Hill, a national event where student’s research is presented to congressmen in Washington D.C.
“Perhaps my favorite research experience was during my internship at the Smithsonian’s National Museum for Natural History. I was able to research with the top scientists in the world and learn tremendously from all the resources around me. I never would have been able to participate in that program had I not had the excellent scientific background CSB/SJU provides,” Saupe said. She is currently working on publishing the results of her summer research.

Saupe’s time as a laboratory teaching assistant has inspired her to continue to graduate school. “I hope I can become an inspirational professor like the ones who have taught me at CSB/SJU,” Saupe said.