General Science

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The general science curriculum allows students to design academic programs that satisfy the requirements for a bachelor of science degree and provide more breadth than traditional science programs. Many exciting areas of scientific inquiry, such as bioinformatics, neuroscience, environmental science, and biophysical science, require broad science backgrounds and encompass several disciplines. Students planning technical careers in one of these areas or careers in the health sciences, in science education, or in a science-related business or social service might be best served by a well-designed multidisciplinary science program.

One strength of the General Science Program is its flexibility. To exploit that strength, students need to design their programs carefully, consulting frequently with the general science director. Course sequences that meet requirements for professional schools and training programs should be selected in consultation with the program director or university advisors that specialize in the specific area (for example the Health Professions Program advisors). Students should seek assistance in program planning when they identify or change career goals, because successful application to professional schools and training programs may require completion of additional courses beyond those required for the general science major.

Examples of cross-disciplinary fields, and the subject-matter areas that might be combined in designing a program, are given below:

- **Animal behavior and ethology—**anthropology, biology, psychology
- **Biophysical sciences—**biology, chemistry, human physiology, physics
- **Cognitive sciences—**computer and information science, mathematics, psychology
- **Environmental sciences—**biology, chemistry, earth sciences, geography, physics
- **Neurosciences—**biology, chemistry, psychology

General science majors are encouraged to consult with the program director during their junior year to ensure that their remaining course work is structured to meet all the requirements for the major. Students should notify the General Science Program office of their intention to graduate at least one term before the proposed graduation date.

Preparation

High school students planning to major in general science should take as much mathematics as possible, including two years of algebra and trigonometry. They should also take science courses in their areas of interest. Students planning to transfer into the General Science Program after two years at a community college or at another college or university should complete courses equivalent to the lower-division requirements listed in this catalog and as many of the university's general-education requirements for a bachelor's degree as possible. Acceptance of transfer courses and credits is determined by evaluators in the Office of Admissions in consultation with departmental advisors.

Upon admission, transfer students should consult with the general science director in the program office.

Careers

Through the General Science Program, prehealth science students preparing for careers in medicine, dentistry, or related fields can meet professional school admission requirements. General science, when combined with a minor or a second major, can work well for students planning careers in science-related business, public relations, and human services.

- **Bachelor of Arts**
- **Bachelor of Science**

Undergraduate Studies

Bachelor of Arts Degree Requirements

Code	Title	Credits
Lower Division [1]		44-56
MATH 251–252	Calculus I-II	
or MATH 246–247	Calculus for the Biological Sciences I-II	
Select three sequences or three-course combinations from the following; two sequences must include labs:		
Anthropology		
ANTH 270	Introduction to Biological Anthropology	
Select two of the following:		
ANTH 171	Introduction to Monkeys and Apes	
ANTH 173	Evolution of Human Sexuality	
ANTH 361	Human Evolution	
ANTH 362	Human Biological Variation	
Biology		
BI 211–214	General Biology I-IV (choose three)	
or BI 281H–283H	Honors Biology I-III	
Chemistry		
Select one of the following:		
CH 221–223 & CH 227–229	General Chemistry and General Chemistry Laboratory	
CH 224H–226H & CH 237–239	Honors General Chemistry and Advanced General Chemistry Laboratory	
Computer and Information Science		
CIS 210–212	Computer Science I-III	
Geography		
GEOG 141	The Natural Environment	
Select two of the following:		
GEOG 181	Our Digital Earth	
GEOG 321	Climatology	
GEOG 322	Geomorphology	
GEOG 323	Biogeography	
GEOG 361	Global Environmental Change	
Earth Sciences		
GEOL 201	Dynamic Planet Earth	

GEOL 202	Earth's Surface and Environment	
GEOL 203	History of Life	
Physics		
Select one of the following:		
PHYS 201–203 & PHYS 204–206	General Physics and Introductory Physics Laboratory	
PHYS 251–253 & PHYS 290	Foundations of Physics I and Foundations of Physics Laboratory	
Upper Division		32
32 credits of approved upper-division science courses (for a complete list of approved courses see the General Science Program website gensci.uoregon.edu/general-science-checksheet) [2]		
Total Credits		76-88

[1] All students must demonstrate a proficiency in mathematics by passing Calculus II. In addition, all students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the list above, two of which must include laboratories. The labs might be imbedded in the class (as with BI, CIS, and GEOL), or taken as separate courses (as with CH and PHYS). All courses must be completed with grades of C– or P (pass) or better. Courses graded N (no pass) or F may be repeated for credit.

[2] Two areas of emphasis from two different departments are required. Each emphasis consists of 12 graded upper-division credits from a single department. At least 24 of of the 32 credits must be taken for letter grades and at least 24 must be taken at the University of Oregon. Four of the 32 credits may be Research (401), Thesis (403), or Supervised College Teaching (402). Other courses numbered 400–409 may not be included unless approved in advance by the general science advisor. Upper-division courses used for another major may not be used to satisfy upper-division general science requirements. All courses must be completed with grades of P or C– or better.

Bachelor of Science Degree Requirements

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or MATH 246–247	Calculus for the Biological Sciences I-II	
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ANTH 362	Human Biological Variation	
Biology		
BI 211–214	General Biology I-IV (choose three)	
or BI 281H–283H	Honors Biology I-III	
Chemistry		
Select one of the following:		
CH 221–223 & CH 227–229	General Chemistry and General Chemistry Laboratory	
CH 224H–226H & CH 237–239	Honors General Chemistry and Advanced General Chemistry Laboratory	
Computer and Information Science		
CIS 210–212	Computer Science I-III	
Geography		
GEOG 141	The Natural Environment	
Select two of the following:		
GEOG 181	Our Digital Earth	
GEOG 321	Climatology	
GEOG 322	Geomorphology	
GEOG 323	Biogeography	
GEOG 361	Global Environmental Change	
Earth Sciences		
GEOL 201	Dynamic Planet Earth	
GEOL 202	Earth's Surface and Environment	
GEOL 203	History of Life	
Physics		
Select one of the following:		
PHYS 201–203 & PHYS 204–206	General Physics and Introductory Physics Laboratory	
PHYS 251–253 & PHYS 290	Foundations of Physics I and Foundations of Physics Laboratory	
Upper Division		32
32 credits of approved upper-division science courses (for a complete list of approved courses see the General Science Program website gensci.uoregon.edu/general-science-checksheet) [2]		
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General science courses must be completed with grades of C– or P (pass) or better. Courses graded N (no pass) or F may be repeated for credit, in accordance with university policy.

The upper-division requirements are for students who declared the general science major fall 2000 or later. Students who declared the major before fall 2000 follow the requirements that were in effect when they declared the major. Upper-division credits used to satisfy minimum requirements of another major may not be used to satisfy upper-division requirements in general science. At least 24 upper-division science credits must be completed at the University of Oregon to meet the general science residency requirement.

Upper-division courses may be selected from the general science website (http://gensci.uoregon.edu).

Honors Program

Students preparing to graduate with honors in general science should notify the program director no later than the first term of the senior year.

Honors in general science centers on a thesis, which is the culmination of research conducted under the direction of a faculty advisor. The advisor does not need to be a member of the general science committee.

To graduate with honors, students must have at least a 3.50 overall grade point average and a GPA of 3.50 or better in the sciences. In addition, they must complete 9 credits of Research (401) or Thesis (403) or both in the appropriate department. These credits must be distributed over at least two terms and cannot be used to fulfill emphasis-area requirements.

Upon approval of the thesis by the advisor and the program director, honors in general sciences are awarded.

For guidelines and calendar, see a general science program director.

Program Planning

Information about program planning and detailed sample programs are available in the General Science Program office. Prehealth science students who choose the general science major should design their programs to meet the admission requirements of the professional school of their choice. See also Preparatory Programs in the **Academic Resources** section of this catalog.

Kindergarten through Secondary Teaching Careers

An academic major in general science can provide a strong background for certain teacher-education licensure programs. Students interested in teaching general science in middle school and junior high school should be aware that the integrated science endorsement requires broader preparation than the minimum requirements for the general science major. The College of Education offers a fifth-year program for middle-secondary teaching licensure in science. See the College of Education (http://catalog.uoregon.edu/archive/2018-2019/education) section of this catalog.

Four-Year Degree Plan

The degree plan shown is only a sample of how students may complete their degrees in four years. There are alternative ways. Students should consult their advisor to determine the best path for them.

Bachelor of Science in General Science with Education Focus

Course	Title		Credits Milestones
First Year			
Fall			
CH 111	Introduction to Chemical Principles	Ideal for solid preparation for CH 221	4
MATH 111	College Algebra	Students should plan to start the degree with MATH courses; mathemati placement test determines which MATH course one should take first	4
WR 121	College Composition I		4
General-education course			4
	Credits		16
Winter			
MATH 112	Elementary Functions		4
WR 122 or WR 123	College Composition II or College Composition III		4
BI 211	General Biology I: Cells	Biology sequence fulfills the life science sequence with laboratory	4
General-education course that also satisfies multicultural requirement			4
	Credits		16

Spring			
BI 212	General Biology II: Organisms		4
MATH 251	Calculus I		4
General-education course that also satisfies multicultural requirement			4
General-education course			4
	Credits		16
Second Year			
Fall			
BI 213 or BI 214	General Biology III: Populations or General Biology IV: Mechanisms	BI 213 or 214 are prerequisite for all upper-division biology courses	4
CH 221 or PHYS 201	General Chemistry I or General Physics	Physical science sequence with laboratory can be either chemistry or physics	4
CH 227 or PHYS 204	General Chemistry Laboratory or Introductory Physics Laboratory		2
General-education course			4
	Credits		14
Winter			
CH 222 or PHYS 202	General Chemistry II or General Physics		4
CH 228 or PHYS 205	General Chemistry Laboratory or Introductory Physics Laboratory		2
MATH 252	Calculus II		4
General-education course			4
	Credits		14
Spring			
CH 223 or PHYS 203	General Chemistry III or General Physics	CH 223 is a prerequisite for CH 331	4
CH 229 or PHYS 206	General Chemistry Laboratory or Introductory Physics Laboratory		2
MATH 243 or MATH 425	Introduction to Methods of Probability and Statistics or Statistical Methods I	Basic mathematical preparation requires 24 credits of MATH; 8 must be upper-division credits	4
General-education course			4
	Credits		14
Third Year			
Fall			
GEOL 201	Dynamic Planet Earth	Geology sequence fulfills the earth science sequence with laboratory	4
CH 331	Organic Chemistry I	Choose either upper-division biology courses or organic chemistry sequence; major requires 32 upper-division credits (including 12 graded credits in one department and 12 graded credits in another)	4
General-education course			4
Elective course		Consider taking electives from the College of Education	4
	Credits		16
Winter			
GEOL 202	Earth's Surface and Environment		4

CH 335	Organic Chemistry II	See biology and chemistry and biochemistry departments about minor requirements	4
Elective courses			8
	Credits		16
Spring			
GEOL 203	History of Life		4
CH 336	Organic Chemistry III		4
Upper-division elective courses		All student must take 62 upper-division credits. Many education programs require practical experience working with children; this experience might qualify for internship credit.	8
	Credits		16
Fourth Year			
Fall			
Upper-division geology course			4
Upper-division mathematics or elective course		Basic mathematics preparation requires 24 credits of MATH; 8 must be upper-division credits	4
Upper-division elective courses			8
	Credits		16
Winter			
Upper-division biology course			4
Upper-division geology course			4
Upper-division elective courses			8
	Credits		16
Spring			
Upper-division biology course			4
Upper-division geology course			4
Upper-division elective course			4
	Credits		12
	Total Credits		182

Bachelor of Science in General Science with Pre-Medical Focus

Course	Title		Credits	Milestones
First Year				
Fall				
CH 111	Introduction to Chemical Principles	Ideal for solid preparation for CH 221	4	
MATH 111	College Algebra	Mathematics placement test determines which MATH course one should take first	4	
WR 121	College Composition I		4	
General-education course			4	
	Credits		16	
Winter				
WR 122 or WR 123	College Composition II or College Composition III		4	
MATH 212	Fundamentals of Elementary Mathematics II		4	
CH 221	General Chemistry I		4	
CH 227	General Chemistry Laboratory		2	
	Credits		14	
Spring				
CH 222	General Chemistry II		4	
CH 228	General Chemistry Laboratory		2	
MATH 251 or MATH 246	Calculus I or Calculus for the Biological Sciences I		4	
General-education course		One year of writing courses is a common medical school requiremer	4	
	Credits		14	

Second Year

Fall

BI 211	General Biology I: Cells		4
CH 223	General Chemistry III	General chemistry must be completed during the second year to leave time for organic chemistry during the third year and biochemistry during the fourth year	4
CH 229	General Chemistry Laboratory		2
General-education course that also satisfies multicultural requirement			4
	Credits		14

Winter

BI 212	General Biology II: Organisms		4
MATH 252 or MATH 247	Calculus II or Calculus for the Biological Sciences II		4
General-education course that also satisfies multicultural requirement			4
General-education course			4
	Credits		16

Spring

BI 214	General Biology IV: Mechanisms		4
MATH 243 or MATH 425	Introduction to Methods of Probability and Statistics or Statistical Methods I	Basic mathematics preparation requires 24 credits of MATH; 8 must be upper-division credits	4
Upper-division general-education course		All students need to take 62 upper-division credits	4
General-education course			4
	Credits		16

Third Year

Fall

BI 320	Molecular Genetics	Common requirement for medical schools	4
CH 331	Organic Chemistry I	See chemistry departmen office about chemistry minor requiremer	4
CH 337	Organic Chemistry Laboratory		3
Upper-division general-education course			4
	Credits		15

Winter

CH 335	Organic Chemistry II	See biology and chemistry and biochemist departmen about minor requiremer	4
CH 338	Organic Chemistry Laboratory		3
BI 358	Investigations in Medical Physiology	Check with specific programs to identify additional prerequisit	4
Upper-division elective course		Many medical schools want practical experience: internship and/or research	4
	Credits		15

Spring

PSY 201 or PSY 202 or PSY 304	Mind and Brain or Mind and Society or Biopsychology	Recommended for MCAT preparation	4
SOC 204 or SOC 207	Introduction to Sociology or Social Inequality	Recommer for MCAT preparatior	4

CH 336	Organic Chemistry III	Prerequisite for biochemistry (common medical school requirement)	4
Upper-division biology course			4
	Credits		16
Fourth Year			
Fall			
PHYS 201	General Physics	Physics should be taken as part of MCAT preparatior	4
PHYS 204	Introductory Physics Laboratory		2
CH 360 or CH 461	Physiological Biochemistry or Biochemistry	Common medical school requiremer	4
Upper-division biology or elective course		See biology department office about biology minor requirements	4
	Credits		14
Winter			
PHYS 202	General Physics		4
PHYS 205	Introductory Physics Laboratory		2
CH 463	Biochemistry	Other upper-division elective may be substituted	4
Upper-division elective courses			6
	Credits		16
Spring			
PHYS 203	General Physics		4
PHYS 206	Introductory Physics Laboratory		2
CH 462	Biochemistry	Other upper-division elective may be substituted	4
Upper-division elective course			4
	Credits		14
	Total Credits		180