Multidisciplinary Science

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The multidisciplinary 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, 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 Multidisciplinary Science Program is its flexibility. To exploit that strength, students need to design their programs carefully, consulting frequently with their Advisors in the Tykeson College and Career Center. Course sequences that meet requirements for professional schools and training programs should be selected in consultation with 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 multidisciplinary 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
- **Bioinformatics—**biology, computer and information science

Multidisciplinary 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 Multidisciplinary 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 multidisciplinary 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 Multidisciplinary 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 multidisciplinary science director in the program office.

Careers

Through the Multidisciplinary Science Program, prehealth science students preparing for careers in medicine, dentistry, or related fields can meet professional school admission requirements. Multidisciplinary 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 MATH/CIS Requirement [1]		**8**
MATH 251	Calculus I	
or MATH 24(	Calculus for the Biological Sciences I	
Select one of the following		
CIS 122	Introduction to Programming and Problem Solving	
MATH 231	Elements of Discrete Mathematics I	
MATH 243	Introduction to Methods of Probability and Statistics	
MATH 247	Calculus for the Biological Sciences II	
MATH 252	Calculus II	
MATH 425	Statistical Methods I (Students who complete MATH 425 as part of the math requirement, cannot also use this same class towards the 32 credits of upper-division General Science major requirements.)	
Select three sequences or three-course combinations from the following; two sequences must include labs: [2]		**36-48**
Anthropology: Applies as a non-lab course combination		
ANTH 270	Introduction to Biological Anthropology (Required for ANTH course combination)	
Select two of the following:		
ANTH 145	Principles of Archaeology	
ANTH 170	Introduction to Human Origins	
ANTH 171	Introduction to Monkeys and Apes	
ANTH 173	Evolution of Human Sexuality	
ANTH 175	Evolutionary Medicine	
ANTH 176	Introduction to Forensic Anthropology	
ANTH 361	Human Evolution	
ANTH 362	Human Biological Variation	
Biology: Applies as a lab sequence		
BI 211–214	General Biology I-IV (choose three: BI 211, BI 212, and either BI 213 or BI 214)	

or BI 281H–283H	Honors Biology I-III	
Chemistry: Can apply as either a lab sequence or a non-lab sequence		
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: Applies as a lab sequence		
CIS 210–212	Computer Science I-III	
Earth Sciences: Applies as a lab sequence		
ERTH 201	Dynamic Planet Earth (OR ERTH 101 with a mid-B or better grade)	
ERTH 202	Earth's Surface and Environment (OR ERTH 102 with a mid-B or better grade)	
ERTH 203	History of Life (OR ERTH 103 with a mid-B or better grade)	
Geography: Applies as a non-lab course combination		
GEOG 141	The Natural Environment (Required for GEOG course combination)	
Select two of the following:		
GEOG 181	Our Digital Earth	
GEOG 321	Climatology	
GEOG 322	Geomorphology	
GEOG 323	Biogeography	
GEOG 360	Watershed Science and Policy	
GEOG 361	Global Environmental Change	
Physics: Can apply as a lab sequence or a non-lab sequence		
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 (must take all 3 terms of PHYS 290 for this to count as a lab sequence)	
Upper Division	**32 credits of approved upper-division courses from the below departments** [3]	**32**
BI, CH, CIS, ERTH, HPHY, MATH, PHYS, and PSY	Upper division courses from these departments are approved for the major.	
ANTH	Upper division ANTH courses from the biological anthropology and physical archeology subfields are approved (for a complete list of approved upper division ANTH courses see the Program website). Experimental courses (410) require program approval.	
GEOG	Upper division GEOG courses from the physical geography and GIScience subfields are approved (for a complete list of approved upper division GEOG courses see the Program website). Experimental courses (410) require program approval.	
Emphasis areas	At least twelve graded credits (not P/NP) must be in one department and at least twelve graded credits must be in a second department. We strongly encourage students to take all majors classes for a grade.	
401-409	4 of the 32 credits may be research (401), thesis (403), or supervised college teaching (402) credits. Seminar, Readings & Conference, Practicum, Internship, and Tutorial credits (404-409) may not be used for the Multidisciplinary Science major.	
Residency requirement	24 credits must be taken at UO.	
Double Majors	upper division credits used for another major may not be used to satisfy MSCI requirements.	
Minors in related fields	There is no MSCI imposed restriction on course overlap between the MSCI major and any minor (though the department offering the minor might have restrictions). We encourage you to look into minors in your emphasis areas.	
Prerequisites	All stduents are subject to all prerequisites, minimum grade requirements, and registration restrictions set by each department for its own courses. These things cannot be circumvented because one is a MSCI major. Please investigate the prerequisites and restrictions for the courses you are interested in taking early on.	
Total Credits		**76-88**

1 All students must demonstrate a proficiency in mathematics by passing calculus I and one additional math or computer science class from the provided list. All courses must be completed with grades of C– or P (pass) or better

2 All students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the provided list, two of which must include laboratories. The labs might be embedded 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, except ERTH 101-103 which must be completed with grades of mid-B or better.

3 All courses must be completed with grades of C– or P or better. All upper division emphasis area courses must be taken for a letter grade.

Bachelor of Science Degree Requirements

Code	Title	Credits
Lower Division MATH/CIS Requirement [1]		**8**
MATH 251	Calculus I	
or MATH 241	Calculus for the Biological Sciences I	
Select one of the following		
CIS 122	Introduction to Programming and Problem Solving	
MATH 231	Elements of Discrete Mathematics I	
MATH 243	Introduction to Methods of Probability and Statistics	
MATH 247	Calculus for the Biological Sciences II	
MATH 252	Calculus II	
MATH 425	Statistical Methods I (Students who complete MATH 425 as part of the math requirement, cannot also use this same class towards the 32 credits of upper-division General Science major requirements.)	
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Select two of the following:		
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ANTH 175	Evolutionary Medicine	
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ANTH 361	Human Evolution	
ANTH 362	Human Biological Variation	
Biology: Applies as a lab sequence		
BI 211–214	General Biology I-IV (choose three: BI 211, BI 212, and either BI 213 or BI 214)	
or BI 281H–283H	Honors Biology I-III	
Chemistry: Can apply as either a lab sequence or a non-lab sequence		
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: Applies as a lab sequence		
CIS 210–212	Computer Science I-III	
Earth Sciences: Applies as a lab sequence		
ERTH 201	Dynamic Planet Earth (OR ERTH 101 with a mid-B or better grade)	
ERTH 202	Earth's Surface and Environment (OR ERTH 102 with a mid-B or better grade)	
ERTH 203	History of Life (OR ERTH 103 with a mid-B or better grade)	
Geography: Applies as a non-lab course combination		
GEOG 141	The Natural Environment (Required for GEOG course combination)	
Select two of the following:		
GEOG 181	Our Digital Earth	
GEOG 321	Climatology	
GEOG 322	Geomorphology	
GEOG 323	Biogeography	
GEOG 360	Watershed Science and Policy	
GEOG 361	Global Environmental Change	
Physics: Can apply as a lab sequence or a non-lab sequence		
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 (must take all 3 terms of PHYS 290 for this to count as a lab sequence)	
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401-409	4 of the 32 credits may be research (401), thesis (403), or supervised college teaching (402) credits. Seminar, Readings & Conference, Practicum, Internship, and Tutorial credits (404-409) may not be used for the Multidisciplinary Science major.	
Residency requirement	24 credits must be taken at UO.	
Double Majors	upper division credits used for another major may not be used to satisfy MSCI requirements.	

Minors in related fields	There is no MSCI imposed restriction on course overlap between the MSCI major and any minor (though the department offering the minor might have restrictions). We encourage you to look into minors in your emphasis areas.
Prerequisites	All stduents are subject to all prerequisites, minimum grade requirements, and registration restrictions set by each department for its own courses. These things cannot be circumvented because one is a MSCI major. Please investigate the prerequisites and restrictions for the courses you are interested in taking early on.
Total Credits	**76-88**

1 All students must demonstrate a proficiency in mathematics by passing calculus I and one additional math or computer science class from the provided list. All courses must be completed with grades of C– or P (pass) or better

2 All students must take three course sequences (or three course combinations in the case of ANTH and GEOG) from the provided list, two of which must include laboratories. The labs might be embedded 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, except ERTH 101-103 which must be completed with grades of mid-B or better.

3 All courses must be completed with grades of C– or P or better. All upper division emphasis area courses must be taken for a letter grade.

Multidisciplinary 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 multidisciplinary 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 multidisciplinary science. At least 24 upper-division science credits must be completed at the University of Oregon to meet the multidisciplinary science residency requirement.

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

Honors Program

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

Honors in multidisciplinary 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 Multidisciplinary Science Committee.

To graduate with honors, students must have at least a 3.50 overall grade point average and an average GPA of 3.50 or better in all classes counting towards the multidisciplinary science major. In addition, they must complete 6 credits (or equivalent experience per-approved by MSCI Director) of Research (401) or Thesis (403) or both in an 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 multidisciplinary science are awarded.

For guidelines and calendar, contact the Multidisciplinary Science Program Director.

Program Planning

Information about program planning and detailed sample programs are available on the Multidisciplinary Science Program website. Pre-health science students who choose the multidisciplinary 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 multidisciplinary science can provide a strong background for certain teacher-education licensure programs. Students interested in teaching 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 multidisciplinary 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/2021-2022/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 Multidisciplinary Science with Education Focus

Course	Title	Credits	Milestones
First Year			
Fall			
CH 111	Introduction to Chemical Principles	4	
MATH 111	College Algebra	4	
WR 121	College Composition I	4	
Core-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	4	
Core-education course that also satisfies multicultural requirement		4	
	Credits	**16**	
Spring			
BI 212	General Biology II: Organisms	4	
MATH 251	Calculus I	4	

Core-education course that also satisfies multicultural requirement		4
Core-education course		4
	Credits	**16**
Second Year		
Fall		
BI 213 or BI 214	General Biology III: Populations or General Biology IV: Mechanisms	4
CH 221 or PHYS 201	General Chemistry I or General Physics	4
CH 227 or PHYS 204	General Chemistry Laboratory or Introductory Physics Laboratory	2
Core-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
Core-education course		4
	Credits	**14**
Spring		
CH 223 or PHYS 203	General Chemistry III or General Physics	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	4
Core-education course		4
	Credits	**14**
Third Year		
Fall		
ERTH 101 or ERTH 201	Exploring Planet Earth (completed with a letter grade of mid-B or higher) or Dynamic Planet Earth	4
CH 331	Organic Chemistry I	4
Core-education course		4
Elective course		4
	Credits	**16**
Winter		
ERTH 102 or ERTH 202	Exploring Earth's Environment (completed with a letter grade of mid-B or higher) or Earth's Surface and Environment	4
CH 335	Organic Chemistry II	4
Elective courses		8
	Credits	**16**
Spring		
ERTH 103 or ERTH 203	Exploring Earth History (completed with a letter grade of mid-B or higher) or History of Life	4
CH 336	Organic Chemistry III	4
Upper-division elective courses		8
	Credits	**16**
Fourth Year		
Fall		
Upper-division earth science course		4
Upper-division mathematics or elective course		4
Upper-division elective courses		8
	Credits	**16**
Winter		
Upper-division biology course		4
Upper-division earth science course		4
Upper-division elective courses		8
	Credits	**16**
Spring		
Upper-division biology course		4
Upper-division earth science course		4
Upper-division elective course		4
	Credits	**12**
	Total Credits	**182**

Bachelor of Science in Multidisciplinary Science with Pre-Medical Focus

Course	Title	Credits Milestones
First Year		
Fall		
CH 111	Introduction to Chemical Principles	4
MATH 111	College Algebra	4
WR 121	College Composition I	4
Core-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
Core-education course		4
	Credits	**14**

Second Year

Fall

BI 211	General Biology I: Cells	4
CH 223	General Chemistry III	4
CH 229	General Chemistry Laboratory	2
Core-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
Core-education course that also satisfies multicultural requirement		4
Core-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	4
Upper-division core-education course		4
Core-education course		4
	Credits	**16**

Third Year

Fall

BI 320	Molecular Genetics	4
CH 331	Organic Chemistry I	4
CH 337	Organic Chemistry Laboratory	3
Upper-division core-education course		4
	Credits	**15**

Winter

CH 335	Organic Chemistry II	4
CH 338	Organic Chemistry Laboratory	3
BI 358	Investigations in Medical Physiology	4
Upper-division elective course		4
	Credits	**15**

Spring

PSY 201 or PSY 202 or PSY 304	Mind and Brain or Mind and Society or Biopsychology	4
SOC 204 or SOC 207	Introduction to Sociology or Social Inequality	4
CH 336	Organic Chemistry III	4
Upper-division biology course		4
	Credits	**16**

Fourth Year

Fall

PHYS 201	General Physics	4
PHYS 204	Introductory Physics Laboratory	2
CH 360 or CH 461	Physiological Biochemistry or Biochemistry	4
Upper-division biology or elective course		4
	Credits	**14**

Winter

PHYS 202	General Physics	4
PHYS 205	Introductory Physics Laboratory	2
CH 463	Biochemistry	4
Upper-division elective courses		6
	Credits	**16**

Spring

PHYS 203	General Physics	4
PHYS 206	Introductory Physics Laboratory	2
CH 462	Biochemistry	4
Upper-division elective course		4
	Credits	**14**
	Total Credits	**180**