

# Multidisciplinary Science

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A multidisciplinary science major allows students to design their own program of study in the natural sciences. Students choose their areas of specialization from a broad range of sciences, tailoring their studies to their specific interests and career goals.

The multidisciplinary science major is useful to students whose interests do not fit well within a single scientific field, as well as students who wish to pursue advanced degrees in health-related fields.

Multidisciplinary Science is different from traditional majors in that it pulls coursework from multiple STEM departments to provide students with a self-guided interdisciplinary education. Unlike many STEM majors, most MSCI students add the major during their junior or senior year. Assessment models that rely on learning outcomes based on the content of specific coursework and subdivided into yearly educational benchmarks are therefore not appropriate for the Multidisciplinary Science Program. Instead, the MSCI program outcomes are tied to its structure, which is designed to:

- Provide students with interdisciplinary curricular choices that develop competencies important for all STEM fields.
- Emphasize and develop skillsets commonly sought by employers.
- Address expectations of students entering the General Science Program, for example timely degree completion.

## Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Develop a personalized plan for timely degree completion in the MSCI program by thoughtfully selecting coursework from multiple STEM departments, taking into account the unique structure of the program and individual academic goals.
- Analyze and articulate connections between chosen STEM disciplines and their applications to career objectives.
- Explain the steps and limitations of the scientific methodology and apply this knowledge to critically evaluate scientific information as presented by popular and professional sources.
- Articulate how the MSCI coursework develops skills that are highly valued by employers, such as critical thinking, problem solving, work ethic, collaboration, effective communication, and analysis and interpretation of quantitative information.

## Multidisciplinary Science Major Requirements

Code	Title	Credits
<b>Lower Division MATH/CS Requirement <sup>1</sup></b>		<b>8</b>
MATH 251	Calculus I	
	or MATH 241/Calculus for the Biological Sciences I	
Select one of the following		

CS 122	Introduction to Programming and Problem Solving
MATH 231	Elements of Discrete Mathematics I
STAT 243Z	Elementary Statistics I
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: <sup>2</sup> 36-48

Anthropology: Applies as a non-lab course combination

ANTH 270	Introduction to Biological Anthropology (Required for ANTH course combination)
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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– Honors Biology I-III 283H

Chemistry: Can apply as either a lab sequence or a non-lab sequence

Select one of the following:

CH 221–223	General Chemistry & CH 227–229 and General Chemistry Laboratory
CH 224H–226H	Honors General Chemistry and Advanced General Chemistry
	& CH 237–239 Laboratory

Computer Science: Applies as a lab sequence

CS 210–212	Computer Science I-III
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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)
<b>Upper Division</b>	<b>32 credits of approved upper-division courses from the below departments</b> <sup>3</sup>
BI, CH, CS, EARTH, HPHY, MATH, PHYS, and PSY	Upper-division courses from these departments are approved for the major.
ANTH	Upper-division ANTH courses from the list below. Experimental courses (410) require program approval.
GEOG	Upper-division GEOG courses from the list below. 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 students 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**

- 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
- 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, CS, 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 EARTH 101-103 which must be completed with grades of mid-B or better.
- 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.

## Approved Courses

Code	Title	Credits
<b>Anthropology</b>		
ANTH 341	Food Origins	4
ANTH 361	Human Evolution	4
ANTH 362	Human Biological Variation	4
ANTH 366	Human Osteology Laboratory	4
ANTH 369	Human Growth and Development	4
ANTH 376	Decoding Your Genome	4
ANTH 442	Northwest Coast Archaeology	4
ANTH 443	North American Archaeology	4
ANTH 446	Practical Archaeobotany	4
ANTH 456	Peopling of the Americas	4
ANTH 459	Advanced Evolutionary Medicine	4
ANTH 462	Primate Evolution	4
ANTH 463	Primate Behavior	4
ANTH 467	Paleoecology and Human Evolution	4
ANTH 468	Evolutionary Theory	4
ANTH 470	Statistical Analysis of Biological Anthropology	4
ANTH 471	Zooarchaeology: [Topic]	4
ANTH 472	Primate Conservation Biology	4
ANTH 473	Advanced Forensic Anthropology	4
ANTH 474	Human Skeletal Pathology	4
ANTH 479	Taphonomy: Bones, Bugs, and Burials	4
ANTH 481	Principles of Evolutionary Psychology	4
ANTH 487	Bioanthropology Methods	4
<b>Geography</b>		
GEOG 321	Climatology	4

GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 341	Population and Environment	4
GEOG 342	Geography of Globalization	4
GEOG 343	Society, Culture, and Place	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421		4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 433	Fire and Natural Disturbances	4
GEOG 481	GIScience I	4
GEOG 482	GIScience II	4
GEOG 485	Remote Sensing I	4
GEOG 486	Remote Sensing II	4
GEOG 491	Advanced Geographic Information Systems	4
GEOG 493	Advanced Cartography	4
GEOG 494	Spatial Analysis	4
GEOG 495	Geographic Data Analysis	4
GEOG 497	Qualitative Methods in Geography	4

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 pre-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.

## 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
<b>First Year</b>			
<b>Fall</b>			
CH 111	Introduction to Chemical Principles	4	
MATH 111Z	Precalculus I: Functions	4	
WR 121Z	Composition I	4	
Core-education course		4	
<b>Credits</b>		<b>16</b>	
<b>Winter</b>			
MATH 112Z	Precalculus II: Trigonometry	4	
WR 122Z	Composition II	4	
	or WR 123 or College Composition III		
BI 211	General Biology I: Cells	5	
Core-education course that also satisfies multicultural requirement		4	
<b>Credits</b>		<b>17</b>	
<b>Spring</b>			
BI 212	General Biology II: Organisms	5	
MATH 251	Calculus I	4	
Core-education course that also satisfies multicultural requirement		4	
Core-education course		4	
<b>Credits</b>		<b>17</b>	
<b>Second Year</b>			
<b>Fall</b>			
BI 213	General Biology III: Ecology and	5	
	or BI 214 Evolution		
	or General Biology IV: Biochemistry and Genetics		
CH 221	General Chemistry I	4	
	or General Physics		
	PHYS 201		
CH 227	General Chemistry Laboratory	2	
	or Introductory Physics Laboratory		
	PHYS 204		
Core-education course		4	
<b>Credits</b>		<b>15</b>	
<b>Winter</b>			
CH 222	General Chemistry II	4	
	or General Physics		
	PHYS 202		
CH 228	General Chemistry Laboratory	2	
	or Introductory Physics Laboratory		
	PHYS 205		
MATH 252	Calculus II	4	

Core-education course	4
<b>Credits</b>	<b>14</b>
<b>Spring</b>	
CH 223 General Chemistry III or PHYS 203 or General Physics	4
CH 229 General Chemistry Laboratory or PHYS 206 or Introductory Physics Laboratory	2
STAT 243Z Elementary Statistics I or MATH 425 or Statistical Methods I	4
Core-education course	4
<b>Credits</b>	<b>14</b>
<b>Third Year</b>	
<b>Fall</b>	
ERTH 101 Exploring Planet Earth (completed with or a letter grade of mid-B or higher) ERTH 201 or Dynamic Planet Earth	4
CH 331 Organic Chemistry I	4
Core-education course	4
Elective course	4
<b>Credits</b>	<b>16</b>
<b>Winter</b>	
ERTH 102 Exploring Earth's Environment or (completed with a letter grade of mid-B ERTH 202 or higher) or Earth's Surface and Environment	4
CH 335 Organic Chemistry II	4
Elective courses	8
<b>Credits</b>	<b>16</b>
<b>Spring</b>	
ERTH 103 Exploring Earth History (completed with or a letter grade of mid-B or higher ) ERTH 203 or History of Life	4
CH 336 Organic Chemistry III	4
Upper-division elective courses	8
<b>Credits</b>	<b>16</b>
<b>Fourth Year</b>	
<b>Fall</b>	
Upper-division earth science course	4
Upper-division mathematics or elective course	4
Upper-division elective courses	8
<b>Credits</b>	<b>16</b>
<b>Winter</b>	
Upper-division biology course	4
Upper-division earth science course	4
Upper-division elective courses	8
<b>Credits</b>	<b>16</b>
<b>Spring</b>	
Upper-division biology course	4
Upper-division earth science course	4

Upper-division elective course	4
<b>Credits</b>	<b>12</b>
<b>Total Credits</b>	<b>185</b>

## Bachelor of Science in Multidisciplinary Science with Pre-Medical Focus

Course	Title	Credits	Milestones
<b>First Year</b>			
<b>Fall</b>			
CH 111	Introduction to Chemical Principles	4	
MATH 111Z	Precalculus I: Functions	4	
WR 121Z	Composition I	4	
Core-education course		4	
<b>Credits</b>		<b>16</b>	
<b>Winter</b>			
WR 122Z	Composition II or WR 123 or College Composition III	4	
MATH 112Z	Precalculus II: Trigonometry	4	
CH 221	General Chemistry I	4	
CH 227	General Chemistry Laboratory	2	
<b>Credits</b>		<b>14</b>	
<b>Spring</b>			
CH 222	General Chemistry II	4	
CH 228	General Chemistry Laboratory	2	
MATH 251	Calculus I or or Calculus for the Biological MATH 246 Sciences I	4	
Core-education course		4	
<b>Credits</b>		<b>14</b>	
<b>Second Year</b>			
<b>Fall</b>			
BI 211	General Biology I: Cells	5	
CH 223	General Chemistry III	4	
CH 229	General Chemistry Laboratory	2	
Core-education course that also satisfies multicultural requirement		4	
<b>Credits</b>		<b>15</b>	
<b>Winter</b>			
BI 212	General Biology II: Organisms	5	
MATH 252	Calculus II or or Calculus for the Biological MATH 247 Sciences II	4	
Core-education course that also satisfies multicultural requirement		4	
Core-education course		4	
<b>Credits</b>		<b>17</b>	
<b>Spring</b>			
BI 214	General Biology IV: Biochemistry and Genetics	5	
STAT 243Z	Elementary Statistics I or or Statistical Methods I MATH 425	4	
Upper-division core-education course		4	

Core-education course		4
<b>Credits</b>		<b>17</b>
<b>Third Year</b>		
<b>Fall</b>		
BI 320	Molecular Genetics	4
CH 331	Organic Chemistry I	4
CH 337	Organic Chemistry Laboratory	3
Upper-division core-education course		4
<b>Credits</b>		<b>15</b>
<b>Winter</b>		
CH 335	Organic Chemistry II	4
CH 338	Organic Chemistry Laboratory	3
BI 358	Investigations in Medical Physiology	4
Upper-division elective course		4
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
PSY 201	Mind and Brain	4
or	or Mind and Society	
PSY 202	or Biopsychology	
or		
PSY 304		
SOC 204	Introduction to Sociology	4
or	or Social Inequality	
SOC 207		
CH 336	Organic Chemistry III	4
Upper-division biology course		4
<b>Credits</b>		<b>16</b>
<b>Fourth Year</b>		
<b>Fall</b>		
PHYS 201	General Physics	4
PHYS 204	Introductory Physics Laboratory	2
CH 360	Physiological Biochemistry	4
or CH 461	or Biochemistry	
Upper-division biology or elective course		4
<b>Credits</b>		<b>14</b>
<b>Winter</b>		
PHYS 202	General Physics	4
PHYS 205	Introductory Physics Laboratory	2
CH 463	Biochemistry	4
Upper-division elective courses		6
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
PHYS 203	General Physics	4
PHYS 206	Introductory Physics Laboratory	2
CH 462	Biochemistry	4
Upper-division elective course		4
<b>Credits</b>		<b>14</b>
<b>Total Credits</b>		<b>183</b>