Multidisciplinary Science

http://gensci.uoregon.edu
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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 Multidisciplinary 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
Lower Division MATH/CS Requirement [1]		**8**
MATH 251Z	Differential Calculus	
or MATH 24(	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 252Z	Integral Calculus	
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 Multidisciplinary Science major requirements.)	
Foundations Courses		**36-48**
Select 3 sequences or 3-course combinations from the following; 2 sequences must include labs. [2, 3]		
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		
Select one of the options:		
Option A:		
BI 221Z	Principles of Biology I: Cells	
BI 222Z	Principles of Biology II: Organisms	
BI 223Z	Principles of Biology III: Ecology and Evolution	
or BI 214	General Biology IV: Biochemistry and Genetics	
Option B:		
BI 281H–283H	Honors Biology I-III	
Chemistry: Can apply as either a lab sequence or a non-lab sequence		
Select one of the options:		
Option A:		
CH 221Z–223Z	General Chemistry I-III	
CH 227Z & CH 217	General Chemistry I Laboratory and Chemistry Tools I [4]	
CH 228Z & CH 218	General Chemistry II Laboratory and Chemistry Tools II [4]	
CH 229Z & CH 219	General Chemistry III Laboratory and Chemistry Tools III [4]	
Option B:		
CH 224H–226H	Honors General Chemistry	
CH 227Z & CH 217	General Chemistry I Laboratory and Chemistry Tools I [4]	

CH 228Z & CH 218	General Chemistry II Laboratory and Chemistry Tools II [4]	
CH 229Z & CH 219	General Chemistry III Laboratory and Chemistry Tools III [4]	
Computer Science: Applies as a lab sequence		
CS 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 [5]**	**32**
BI, CH, CS, ERTH, 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.	
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**

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

3 If an upper-division course is used towards the Foundations requirements, the same course cannot also be used to satisfy the other upper-division MSCI requirements.

4 Students who transfer CH 227Z/228Z/229Z credits from other schools may have the corresponding CH 217/218/219 course and credit requirements waived.

5 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.

Additional Requirements

At least 24 upper-division credits must be taken at the University of Oregon.

Approved Courses

Code	Title	Credits
Anthropology		
ANTH 332	Human Attraction and Mating Strategies	4
ANTH 341	Food Origins	4
ANTH 349	Origins of Art	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		4

ANTH 446		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		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		4
ANTH 479	Taphonomy: Bones, Bugs, and Burials	4
ANTH 481	Principles of Evolutionary Psychology	4
ANTH 487	Bioanthropology Methods	4
Geography		
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 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 and Geo-Visualization	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
First Year		
Fall		
CH 111	Introduction to Chemical Principles	4
MATH 111Z	Precalculus I: Functions	4
WR 121Z	Composition I	4
Core-education course		4
	Credits	**16**
Winter		
MATH 112Z	Precalculus II: Trigonometry	4
WR 122Z or WR 123	Composition II or College Composition III	4
BI 221Z	Principles of Biology I: Cells	5
Core-education course that also satisfies multicultural requirement		4
	Credits	**17**
Spring		
BI 222Z	Principles of Biology II: Organisms	5
MATH 251Z	Differential Calculus	4
Core-education course that also satisfies multicultural requirement		4
Core-education course		4
	Credits	**17**

Second Year		
Fall		
BI 223Z or BI 214	Principles of Biology III: Ecology and Evolution or General Biology IV: Biochemistry and Genetics	5
CH 221Z or PHYS 201	General Chemistry I or General Physics	4
CH 227Z & CH 217 or PHYS 204	General Chemistry I Laboratory or Introductory Physics Laboratory	2
Core-education course		4
	Credits	**15**
Winter		
CH 222Z or PHYS 202	General Chemistry II or General Physics	4
CH 228Z & CH 218 or PHYS 205	General Chemistry II Laboratory or Introductory Physics Laboratory	2
MATH 252Z	Integral Calculus	4
Core-education course		4
	Credits	**14**
Spring		
CH 223Z or PHYS 203	General Chemistry III or General Physics	4
CH 229Z & CH 219 or PHYS 206	General Chemistry III Laboratory or Introductory Physics Laboratory	2
STAT 243Z or MATH 425	Elementary Statistics I 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	**185**

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 111Z	Precalculus I: Functions	4
WR 121Z	Composition I	4
Core-education course		4
	Credits	**16**
Winter		
WR 122Z or WR 123	Composition II or College Composition III	4
MATH 112Z	Precalculus II: Trigonometry	4
CH 221Z	General Chemistry I	4
CH 227Z & CH 217	General Chemistry I Laboratory and Chemistry Tools I	2
	Credits	**14**
Spring		
CH 222Z	General Chemistry II	4
CH 228Z & CH 218	General Chemistry II Laboratory and Chemistry Tools II	2
MATH 251Z or MATH 246	Differential Calculus or Calculus for the Biological Sciences I	4
Core-education course		4
	Credits	**14**

Second Year

Fall

BI 221Z	Principles of Biology I: Cells	5
CH 223Z	General Chemistry III	4
CH 229Z & CH 219	General Chemistry III Laboratory and Chemistry Tools III	2
Core-education course that also satisfies multicultural requirement		4
	Credits	**15**

Winter

BI 222Z	Principles of Biology II: Organisms	5
MATH 252Z or MATH 247	Integral Calculus or Calculus for the Biological Sciences II	4
Core-education course that also satisfies multicultural requirement		4
Core-education course		4
	Credits	**17**

Spring

BI 214	General Biology IV: Biochemistry and Genetics	5
STAT 243Z or MATH 425	Elementary Statistics I or Statistical Methods I	4
Upper-division core-education course		4
Core-education course		4
	Credits	**17**

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 201Z or PSY 202Z or PSY 304	Introduction to Psychology I or Introduction to Psychology II or Biopsychology	4
SOC 204Z 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	**183**