ENVIRONMENTAL SCIENCE

ASSOCIATE OF SCIENCE (AS) – 60 CREDITS

About this program

The Associate of Science in Environmental Science is designed to provide students an avenue to a four-year environmental science degree, preparing them for a career in an environmental field. The program emphasizes a broad background in natural sciences, ensuring students are properly prepared for further study at an advanced level.

Program outcomes

1. Utilize the scientific method to formulate and test hypotheses through experimental design.
2. Explain and apply basic principles of natural and physical sciences.
3. Relate principles of biology and chemistry to environmental systems.
4. Evaluate the inter-relatedness of human social, ethical and political issues and the natural environment.
5. Demonstrate effective oral and written communication skills.
6. Apply, evaluate and synthesize laboratory techniques, field methods, data collection and data analysis.

Curriculum overview

Crds	Requirement type
45	Required courses
6	Restricted electives in courses
3	Restricted electives in MnTC Goal Areas
3	Restricted electives in course types
57	**Total**

Developmental courses note: A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

Accreditation: Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. The Higher Learning Commission 230 South LaSalle Street, Suite 7-500 Chicago, IL 60604-1411 http://www.ncahigherlearningcommission.org Phone: 312.263.0456 / 800.621.7440

Curriculum requirement details

Required courses

Course	Crds
BIOL1107 - Environmental Science Issues	3
BIOL1108 - Environmental Science Issues Lab	1
BIOL1122 - General Biology I	4
BIOL1123 - General Biology II	4
BIOL2010 - General Ecology	4
CHEM1111 - General Chemistry I	5
CHEM1112 - General Chemistry II	5
COMM1120 - Introduction to Public Speaking	3
ECON2210 - Macroeconomics	3
ENGL1101 - College Writing	3
GEOG1110 - World Regional Geography	3
MATH1114 - College Algebra	4
MATH1207 - Missing title	
PHIL1201 - Ethics	3

Other requirements or restricted electives

3 credits from one or more of these Courses:

Course title	Credits
POLS2204 - Comparative Government	3
POLS2206 - Global Politics	3

3 credits from one or more of these Courses:

Course title	Credits
ENGL1205 - Writing About Literature	3
ENGL1210 - Writing About Current Issues	3
ENGL1215 - Professional and Technical Writing	3

3 credits from these Goal Areas:

- 6. The Humanities and Fine Arts

3 credits from these Course Types:

- General Education w/MnTC Goals

Course summaries

BIOL1107 - Environmental Science Issues ..... ***(3 credits)***
Meets MnTC Goal Areas 2, 3 and 10. This courses involves the discussion and study of ecosystems, biodiversity, human adaptations to and modifications of those ecosystems, and current environmental problems and their possible solutions. This course includes lab-like experiences including an ecosystem observation and data analysis. This course is for non-science majors.

BIOL1108 - Environmental Science Issues Lab ..... ***(1 credits)***
Meets MnTC Goal Areas 2, 3 and 10. This course includes laboratory work completed in conjunction with BIOL 1107 Environmental Science Issues. Laboratory experiences may include lab and field exercises, computer simulations and collection and analysis of data related to current environmental issues and their possible solutions. This optional lab must be taken concurrently with BIOL 1107.

BIOL1122 - General Biology I ..... ***(4 credits)***
Meets MnTC Goal Areas 2 and 3. This course is an introduction to the structure and function of living systems with an emphasis on cellular and molecular biology. Fundamental concepts include the chemical basis of life, cell structure and function, cell division, metabolism, classical and molecular genetics, and biotechnology. This course includes a laboratory component incorporating experimental design, microscopic work, and cellular and molecular biology techniques. Along with BIOL1123, this course is part of a two-semester sequence of general biology that can be taken in any order.

Prerequisites:

- Assessment into ENGL 1101 or college level writing equivalent.

BIOL1123 - General Biology II ..... ***(4 credits)***
Meets MnTC Goal Areas 3 and 10. This course is an introduction to living organisms, emphasizing evolution, biological diversity and ecology. Topics will include mechanisms of evolution, classification and diversity of life, structure and function of organisms, and interaction of organisms at all levels of an ecosystem. This course includes a laboratory component incorporating field activities, microscopic work, dissection and plant systems. Along with BIOL1122, this course is part of a two-semester sequence of general biology that can be taken in any order.

Prerequisites:

- Assessment into ENGL 1101 or college level writing equivalent.

BIOL2010 - General Ecology ..... ***(4 credits)***
Meets MnTC Goal Areas 3 and 10. This course provides a study of the structure and function of ecological systems, including an application of ecological principles to local and global environmental issues. Topics covered include energy flow, nutrient cycling, organization, ecological succession, population dynamics (including the ecology of species interactions and factors that influence and regulate population numbers) and linkages among species and ecosystem functions. Lecture is accompanied by laboratory and field exercises.

Prerequisites:

- BIOL1122
- BIOL1123
- Completion of MATH 1020 or placement into MATH 1114

CHEM1111 - General Chemistry I ..... ***(5 credits)***
Meets MnTC Goal Areas 2 and 3. This course is the first of a two-course series (CHEM1111 and CHEM1112) intended for science majors. Students will learn the general chemistry principles: problem solving, nomenclature, atomic structure, electronic structure, stoichiometry, titration, reaction types, molecular structure, thermochemistry, electronic structure, and properties and laws of gases. The course includes a lab. Students completing the two-semester sequence will be competent in all areas listed in General Chemistry I & II of the Minnesota State Chemistry Transfer Pathway.

Prerequisites:

- MATH1020

CHEM1112 - General Chemistry II ..... ***(5 credits)***
Meets MnTC Goal Areas 2 and 3. This course is the second of a two-course series (CHEM1111 and CHEM1112) intended for science majors. Students will learn the general chemistry principles: intermolecular forces, properties of solids and liquids, solution chemistry, kinetics, chemical equilibrium, acid-base equilibrium, solubility equilibrium, thermodynamics, electrochemistry, nuclear chemistry, and possibly coordination chemistry and an introduction to environmental chemistry. The course includes a lab. Students completing the two-semester sequence will be competent in all the areas listed in General Chemistry I & II of the Minnesota State Chemistry Transfer Pathway.

Prerequisites:

- CHEM1111
- MATH1114

COMM1120 - Introduction to Public Speaking ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course clarifies the process of oral communication, clarifies the basic principles of public speaking and allows the student to increase the application of these principles while both speaking and listening.

Prerequisites:

- Assessment into ENGL 1101

ECON2210 - Macroeconomics ..... ***(3 credits)***
This course provides the student with a means to study economic principles as they relate to determinants of national income, national income accounting, business cycles, unemployment, inflation and aggregate expenditures. The course also examines macroeconomic policy and provides information to gain further understanding in the areas of fiscal policy, financial markets, money and banking, monetary policy, international policy and the varying viewpoints that have evolved throughout history, including the Keynesian and Monetarist schools of thought.

ENGL1101 - College Writing ..... ***(3 credits)***
Meets MnTC Goal Area 1. This is an introductory writing course designed to prepare students for later college and career writing. The course focuses on developing fluency through a process approach, with particular emphasis on revision. Students will consider purpose and audience, read and discuss writing and further develop their own writing processes through successive revisions to produce polished drafts. Coursework will include an introduction to argumentative writing, writing from academic sources and a short research project.

Prerequisites:

- Completion of ELL1085, ENGL0096, or ENGL0097 with a grade of C or higher OR placement into college-level English.

GEOG1110 - World Regional Geography ..... ***(3 credits)***
Meets MnTC Goal Areas 5 and 8. Students will gain an understanding and appreciation of the spatial relationship of the physical and human elements of our world with an emphasis on the interdependence of nations and peoples. Geography describes the earth's environments and gives character to places through words, maps and graphics, and this course will explore these elements and their contributions to the diversity of world geography. Students will become aware of how the world and the earth's people interact in local regions and in patterns around the globe.

MATH1114 - College Algebra ..... ***(4 credits)***
Meets MnTC Goal Areas 2 and 4. This course includes rational, polynomial, exponential, logarithmic, inverse and quadratic functions. The course also includes equations, inequalities, complex numbers and systems of linear equations. Additional topics may include matrices and determinants.

Prerequisites:

- MATH1020

OR

- Placement Exam

MATH1207 - Missing title ..... ***(credits)***
Missing description

PHIL1201 - Ethics ..... ***(3 credits)***
Meets MnTC Goal Areas 2, 6 and 9. This course is an introduction to the topic of ethics. In this course, the following questions are examined: What is ethics? How do we make ethical decisions? Are things that are legally right necessarily right? Should we consider our own interests when making ethical decisions? Are things ethically right simply because God says they are right? If our culture says something is ethically right, does that mean it is ethically right? The course also examines numerous topical ethical issues such as racism, terrorism and censorship.

POLS2204 - Comparative Government ..... ***(3 credits)***
Meets MnTC Goal Areas 5 and 8. This course provides an introduction to the various systems of government used around the world. Students will compare the processes and institutions of both industrialized and underdeveloped nations and explore how cultures and histories have affected the development of those political systems.

POLS2206 - Global Politics ..... ***(3 credits)***
Meets MnTC Goal Areas 5 and 8. This course is an introduction to the field of global and international politics, with an emphasis on the history, structure and processes of global relations. Students will study the role of state and non-state actors such as nations, international conflict, war, global economic relations and international organizations.

ENGL1205 - Writing About Literature ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course builds on the foundations of College Writing and provides students with additional opportunities to develop fluency in their writing through a process approach. Students will read critically from a variety of literary genres, explore meaning through academic research and respond through discussion and writing.

ENGL1210 - Writing About Current Issues ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course builds on the foundations of College Writing and provides students with additional opportunities to develop and refine their writing through a process approach. Students will explore current issues by critically reading a variety of texts, conducting academic research and responding through discussion and writing.

ENGL1215 - Professional and Technical Writing ..... ***(3 credits)***
Meets MnTC Goal Area 1. This course provides instruction in writing and designing professional and technical documents, including print and non-print correspondence, descriptions, instructions, reports and proposals, along with promotional material. Analysis, critical thinking and synthesis of sources will be covered, along with the development of presentation skills. Coursework also includes a formally documented, multi-source professional project.

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Program Plan — "Primary"

Locations: Fergus Falls,Moorhead

1st Fall Term (16 credits)

Courses

Course	Crds
BIOL1122 - General Biology I	4
COMM1120 - Introduction to Public Speaking	3
ECON2210 - Macroeconomics	3
ENGL1101 - College Writing	3

3 credits in one or more of the following:

General Education w/MnTC Goals

1st Spring Term (15 credits)

Courses

Course	Crds
BIOL1107 - Environmental Science Issues	3
BIOL1108 - Environmental Science Issues Lab	1
BIOL1123 - General Biology II	4
MATH1114 - College Algebra	4

3 credits in one or more of the following:

POLS2204 - Comparative Government 3
POLS2206 - Global Politics 3

2nd Fall Term (15 credits)

Courses

Course	Crds
BIOL2010 - General Ecology	4
CHEM1111 - General Chemistry I	5
GEOG1110 - World Regional Geography	3
PHIL1201 - Ethics	3

2nd Spring Term (14 credits)

Courses

Course	Crds
CHEM1112 - General Chemistry II	5
MATH1207 - Missing title	

3 credits in one or more of the following:

Goal Area 6. The Humanities and Fine Arts

3 credits in one or more of the following:

ENGL1205 - Writing About Literature 3
ENGL1210 - Writing About Current Issues 3
ENGL1215 - Professional and Technical Writing 3