

CLAYTON H. RIDDELL FACULTY OF ENVIRONMENT, EARTH, AND RESOURCES/ UNIVERSITY COLLEGE OF THE NORTH ARTICULATION AGREEMENT - BACHELOR OF ENVIRONMENTAL SCIENCE PROGRAMS

Bachelor of Environmental Science - Major Program Chart

Course	Title	Hours
Year 1		
ENVR 1000	Environmental Science 1 - Concepts	3
ENVR 2000	Environmental Science 2 - Issues	3
BIOL 1020	Biology 1: Principles and Themes ¹⁰	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions ¹⁰	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics ¹	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
CHEM 1120	Introduction to Chemistry Techniques ¹	3
MATH 1500	Introduction to Calculus ²	3
STAT 1000	Basic Statistical Analysis 1 ³	3
ECON 1010	Introduction to Microeconomic Principles	3
Hours		30
Year 2		
ENVR 2810	Environmental Critical Thinking and Scientific Research	3
ENVR 3160	Environmental Responsibilities and the Law ⁵	3
BIOL 2300 or AGECE 2370	Principles of Ecology ¹¹ or Principles of Ecology	3
ECON 2390 or ABIZ 2390	Introduction to Environmental Economics or Introduction to Environmental Economics	3
PHYS 1020	General Physics 1 ⁶	3
STAT 2000	Basic Statistical Analysis 2 ³	3
One of the following:		3
PHYS 1030	General Physics 2 ⁶	
MATH 1200	Elements of Discrete Mathematics	
MATH 1300	Vector Geometry and Linear Algebra ⁷	
MATH 1700	Calculus 2 ⁷	
One of the following:		3
GEOG 1290	Introduction to Physical Geography	
GEOL 1340	The Dynamic Earth ¹²	

Faculty of Arts Course ⁴		3
Hours		27
Years 3-4		
ENVR 4110	Critical Thinking and the Environment	3
Focus area courses including: ⁸		33
BIOL 2XXX		
ENVR 2XXX		
GEOG 2XXX		
ENVR 4XXX		
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
GEOG 3200	Introduction to Remote Sensing (TS)	
Elective credits including:		27
GEOG 1XXX		
BIOL 2XXX		
REC 2XXX		
ENVR 2XXX		
ENVR 2350	Technical Communication in the Environmental Sectors	
Hours		63
Total Hours		120

- ¹ The former CHEM 1300 and CHEM 1310 may be used in lieu of CHEM 1100, CHEM 1110, and CHEM 1120. CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120.
- ² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500 (or equivalent).
- ³ STAT 1150 and STAT 2150 may be used in lieu of STAT 1000 and STAT 2000.
- ⁴ The former ENVR 2170 or the former ENVR 2270 may be used in lieu of ENVR 2810.
- ⁵ The former ENVR 2650 may be used in lieu of ENVR 3160.
- ⁶ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030.
- ⁷ MATH 1310 and MATH 1710 may be taken in place of MATH 1300 and MATH 1700 (or equivalent).
- ⁸ Focus Area courses must include a minimum of 21 credit hours at the 3000- and/or 4000-level. Focus Area performance requirements are defined in Minimum Performance Requirements for Continuation and Graduation (<https://catalog.umanitoba.ca/undergraduate-studies/environment-earth-resources/environment-geography/environmental-science-benvsc-honours/#Minimum-Performance-Requirements>). Information on Focus Areas is available in the Focus Area Brochure.
- ⁹ Equivalent courses offered through Université de Saint-Boniface may be used in lieu of the specific course identified in the program requirements chart.
- ¹⁰ RRR 1030 (Botany) and RRR 1060 (Zoology) are not exact equivalents of BIOL 1020 and BIOL 1030/1010; however, they may be used to satisfy the Biology requirement for the Environmental Science and Studies program.
- ¹¹ For students admitted under the Articulation Agreement, RRR 1010 (General Ecology) may be used to satisfy the requirement for BIOL 2300 or AGECE 2370 in the Environmental Science program, although the courses are not exact equivalents.

¹²For students admitted under the Articulation Agreement, RRR 1020 (Earth Science) may be used to satisfy the Earth Sciences requirement of the program, equivalent to GEOL 1XXX.

Bachelor of Environmental Science - Major Co-op Program Chart

Course	Title	Hours
Year 1		
ENVR 1000	Environmental Science 1 - Concepts	3
ENVR 2000	Environmental Science 2 - Issues	3
BIOL 1020	Biology 1: Principles and Themes ¹⁰	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions ¹⁰	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics ¹	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
CHEM 1120	Introduction to Chemistry Techniques ¹	3
MATH 1500	Introduction to Calculus ²	3
STAT 1000	Basic Statistical Analysis 1 ³	3
ECON 1010	Introduction to Microeconomic Principles	3
Hours		30
Year 2		
ENVR 2810	Environmental Critical Thinking and Scientific Research ⁴	3
ENVR 3160	Environmental Responsibilities and the Law ⁵	3
BIOL 2300 or AGECE 2370	Principles of Ecology ¹¹ or Principles of Ecology	3
ECON 2390 or ABIZ 2390	Introduction to Environmental Economics or Introduction to Environmental Economics	3
PHYS 1020	General Physics 1 ⁶	3
STAT 2000	Basic Statistical Analysis 2 ³	3
ENVR 2900	Professional Development in the Environmental Sectors 1	1.5
One of the following:		3
PHYS 1030	General Physics 2 ⁶	
MATH 1200	Elements of Discrete Mathematics	
MATH 1300	Vector Geometry and Linear Algebra ⁷	
MATH 1700	Calculus 2 ⁷	
One of the following:		3
GEOG 1290	Introduction to Physical Geography	
GEOL 1340	The Dynamic Earth ¹²	
Faculty of Arts Course		3
ENVR 3980	Coop Work Term 1	0
ENVR 3910	Coop Work Term Report 1	1.5
Hours		30
Years 3-4		
ENVR 4110	Critical Thinking and the Environment	3
ENVR 3900	Professional Development in the Environmental Sectors 2	1.5
ENVR 3990	Coop Work Term 2	0

ENVR 3920	Coop Work Term Report 2	1.5
ENVR 4980	Work Term 3 (optional)	0
ENVR 4910	Coop Work Term Report 3 (optional)	1.5
Focus area courses including: ⁸		33
BIOL 2XXX		
ENVR 2XXX		
GEOG 2XXX		
ENVR 4XXX		
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
GEOG 3200	Introduction to Remote Sensing (TS)	
Elective credits including:		21
GEOG 1XXX		
REC 2XXX		
ENVR 2XXX		
BIOL 2XXX		
ENVR 2350	Technical Communication in the Environmental Sectors	
Hours		61.5
Total Hours		121.5

- ¹ The former CHEM 1300 and CHEM 1310 may be used in lieu of CHEM 1100, CHEM 1110 and CHEM 1120. CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120.
- ² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500 (or equivalent).
- ³ STAT 1150 and STAT 2150 may be used in lieu of STAT 1000 and STAT 2000.
- ⁴ The former ENVR 2170 or the former ENVR 2270 may be used in lieu of ENVR 2810.
- ⁵ The former ENVR 2650 may be used in lieu of ENVR 3160.
- ⁶ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030.
- ⁷ MATH 1310 and MATH 1710 may be taken in place of MATH 1300 and MATH 1700 (or equivalent).
- ⁸ Focus Area courses must include a minimum of 21 credit hours at the 3000- and/or 4000-level. Focus Area performance requirements are defined in Minimum Performance Requirements for Continuation and Graduation (<https://catalog.umanitoba.ca/undergraduate-studies/environment-earth-resources/environment-geography/environmental-science-benvsc-honours/#Minimum-Performance-Requirements>). Information on Focus Areas is available in the Focus Area Brochure.
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- ¹¹ For students admitted under the Articulation Agreement, RRR 1010 (General Ecology) may be used to satisfy the requirements for BIOL 2300 or AGECE 2370 in the Environmental Science program, although the courses are not exact equivalents.

¹²For students admitted under the Articulation Agreement, RRR 1020 (Earth Science) may be used to satisfy the Earth Sciences requirement of the program, equivalent to GEOL 1XXX.

¹³Students in the cooperative education option who complete ENVR 4980 and ENVR 4910 will graduate with an additional 1.5 degree credits for a total of 121.5 credit hours.

Bachelor of Environmental Science - Honours Program Chart

Course	Title	Hours
Year 1		
ENVR 1000	Environmental Science 1 - Concepts	3
ENVR 2000	Environmental Science 2 - Issues	3
BIOL 1020	Biology 1: Principles and Themes ¹⁰	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions ¹⁰	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics ¹	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
CHEM 1120	Introduction to Chemistry Techniques ¹	3
MATH 1500	Introduction to Calculus ²	3
STAT 1000	Basic Statistical Analysis 1 ³	3
ECON 1010	Introduction to Microeconomic Principles	3
Hours		30
Year 2		
ENVR 2810	Environmental Critical Thinking and Scientific Research ⁴	3
ENVR 3160	Environmental Responsibilities and the Law ⁵	3
BIOL 2300 or AGECE 2370	Principles of Ecology ¹¹ or Principles of Ecology	3
ECON 2390 or ABIZ 2390	Introduction to Environmental Economics or Introduction to Environmental Economics	3
PHYS 1020	General Physics 1 ⁶	3
STAT 2000	Basic Statistical Analysis 2 ³	3
One of the following:		3
PHYS 1030	General Physics 2 ⁶	
MATH 1200	Elements of Discrete Mathematics	
MATH 1300	Vector Geometry and Linear Algebra ⁷	
MATH 1700	Calculus 2 ⁷	
One of the following:		3
GEOL 1290	Introduction to Physical Geography	
GEOL 1340	The Dynamic Earth ¹²	
Faculty of Arts Course		3
Hours		27
Years 3-4		
ENVR 4110	Critical Thinking and the Environment	3
ENVR 4500	Thesis Project in Environmental Science and Studies	6
Focus area courses including: ⁸		33
BIOL 2XXX		

ENVR 2XXX	
GEOG 2XXX	
ENVR 4XXX	
ENVR 3020	Extended Field Topics in Environmental Science 1
ENVR 3020	Extended Field Topics in Environmental Science 1
ENVR 3020	Extended Field Topics in Environmental Science 1
GEOG 3200	Introduction to Remote Sensing (TS)
Elective credits including:	
18	
GEOG 1XXX	
REC 2XXX	
ENVR 2XXX	
BIOL 2XXX	
ENVR 2350	Technical Communication in the Environmental Sectors
Hours	
60	
Total Hours	
117	

¹ The former CHEM 1300 and CHEM 1310 may be used in lieu of CHEM 1100, CHEM 1110, and CHEM 1120. CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120.

² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500 (or equivalent).

³ STAT 1150 and STAT 2150 may be used in lieu of STAT 1000 and STAT 2000.

⁴ The former ENVR 2170 or the former ENVR 2270 may be used in lieu of ENVR 2810.

⁵ The former ENVR 2650 may be used in lieu of ENVR 3160.

⁶ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030.

⁷ MATH 1310 and MATH 1710 may be taken in place of MATH 1300 and MATH 1700 (or equivalent).

⁸ Focus Area courses must include a minimum of 21 credit hours at the 3000- and/or 4000-level. Focus Area performance requirements are defined in Minimum Performance Requirements for Continuation and Graduation (<https://catalog.umanitoba.ca/undergraduate-studies/environment-earth-resources/environment-geography/environmental-science-benvsc-honours/#Minimum-Performance-Requirements>). Information on Focus Areas is available in the Focus Area Brochure.

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¹¹For students admitted under the Articulation Agreement, RRR 1010 (General Ecology) may be used to satisfy the requirement for BIOL 2300 or AGECE 2370 in the Environmental Science program, although the courses are not exact equivalents.

¹²For students admitted under the Articulation Agreement, RRR 1020 (Earth Science) may be used to satisfy the Earth Sciences requirement of the program, equivalent to GEOL 1XXX.

Bachelor of Environmental Science - Honours Co-op

Course	Title	Hours
Year 1		
ENVR 1000	Environmental Science 1 - Concepts	3
ENVR 2000	Environmental Science 2 - Issues	3
BIOL 1020	Biology 1: Principles and Themes ¹⁰	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions ¹⁰	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics ¹	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
CHEM 1120	Introduction to Chemistry Techniques ¹	3
MATH 1500	Introduction to Calculus ²	3
STAT 1000	Basic Statistical Analysis 1 ³	3
ECON 1010	Introduction to Microeconomic Principles	3
Hours		30
Year 2		
ENVR 2810	Environmental Critical Thinking and Scientific Research ⁴	3
ENVR 3160	Environmental Responsibilities and the Law ⁵	3
BIOL 2300 or AGECE 2370	Principles of Ecology ¹¹ or Principles of Ecology	3
ECON 2390 or ABIZ 2390	Introduction to Environmental Economics or Introduction to Environmental Economics	3
PHYS 1020	General Physics 1 ⁶	3
STAT 2000	Basic Statistical Analysis 2 ³	3
ENVR 2900	Professional Development in the Environmental Sectors 1	1.5
One of the following:		3
PHYS 1030	General Physics 2 ⁶	
MATH 1200	Elements of Discrete Mathematics	
MATH 1300	Vector Geometry and Linear Algebra ⁷	
MATH 1700	Calculus 2 ⁷	
One of the following:		3
GEOG 1290	Introduction to Physical Geography	
GEOL 1340	The Dynamic Earth ¹²	
Faculty of Arts Course		3
ENVR 3980	Coop Work Term 1	0
ENVR 3910	Coop Work Term Report 1	1.5
Hours		30
Years 3-4		
ENVR 4110	Critical Thinking and the Environment	3
ENVR 4500	Thesis Project in Environmental Science and Studies	6
ENVR 3900	Professional Development in the Environmental Sectors 2	1.5
ENVR 3990	Coop Work Term 2	0
ENVR 3920	Coop Work Term Report 2	1.5
ENVR 4980	Work Term 3 (optional)	0

ENVR 4910	Coop Work Term Report 3 (optional)	1.5
Focus area courses including:		33
BIOL 2XXX		
ENVR 2XXX		
GEOG 2XXX		
ENVR 4XXX		
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
GEOG 3200	Introduction to Remote Sensing (TS)	
Elective credits including:		15
GEOG 1XXX		
BIOL 2XXX		
REC 2XXX		
ENVR 2XXX		
ENVR 2350	Technical Communication in the Environmental Sectors	
Hours		61.5
Total Hours		121.5

¹ The former CHEM 1300 and CHEM 1310 may be used in lieu of CHEM 1100, CHEM 1110, and CHEM 1120. CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120.

² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500 (or equivalent).

³ STAT 1150 and STAT 2150 may be used in lieu of STAT 1000 and STAT 2000.

⁴ The former ENVR 2170 or the former ENVR 2270 may be used in lieu of ENVR 2810.

⁵ The former ENVR 2650 may be used in lieu of ENVR 3160.

⁶ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030.

⁷ MATH 1310 and MATH 1710 may be taken in place of MATH 1300 and MATH 1700 (or equivalent).

⁸ Focus Area courses must include a minimum of 21 credit hours at the 3000- and/or 4000-level. Focus Area performance requirements are defined in Minimum Performance Requirements for Continuation and Graduation (<https://catalog.umanitoba.ca/undergraduate-studies/environment-earth-resources/environment-geography/environmental-science-benvsc-honours/#Minimum-Performance-Requirements>). Information of Focus Areas is available in the Focus Area Brochure.

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¹² For students admitted under the Articulation Agreement, RRR 1020 (Earth Science) may be used to satisfy the Earth Sciences requirement of the program, equivalent to GEOL 1XXX.

¹³Students in the cooperative education option who complete ENVR 4980 and ENVR 4910 will graduate with an additional 1.5 degree credits for a total of 121.5 credit hours.

Bachelor of Environmental Science - General

Course	Title	Hours
Year 1		
ENVR 1000	Environmental Science 1 - Concepts	3
ENVR 2000	Environmental Science 2 - Issues	3
BIOL 1020	Biology 1: Principles and Themes ¹⁰	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions ¹⁰	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics ¹	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
CHEM 1120	Introduction to Chemistry Techniques ¹	3
MATH 1500	Introduction to Calculus ²	3
STAT 1000	Basic Statistical Analysis 1 ³	3
ECON 1010	Introduction to Microeconomic Principles	3
Hours		30
Year 2		
ENVR 2810	Environmental Critical Thinking and Scientific Research ⁴	3
ENVR 3160	Environmental Responsibilities and the Law ⁵	3
BIOL 2300 or AGECE 2370	Principles of Ecology ¹¹ or Principles of Ecology	3
ECON 2390 or ABIZ 2390	Introduction to Environmental Economics or Introduction to Environmental Economics	3
PHYS 1020	General Physics 1 ⁶	3
STAT 2000	Basic Statistical Analysis 2 ³	3
One of the following:		3
PHYS 1030	General Physics 2 ⁶	
MATH 1200	Elements of Discrete Mathematics	
MATH 1300	Vector Geometry and Linear Algebra ⁷	
MATH 1700	Calculus 2 ⁷	
One of the following:		3
GEOG 1290	Introduction to Physical Geography	
GEOL 1340	The Dynamic Earth ¹²	
Faculty of Arts Courses		3
Hours		27
Years 3-4		
ENVR 4110	Critical Thinking and the Environment	3
Focus Area courses includes: ⁸		9
ENVR 4XXX		
GEOG 2XXX		
GEOG 3200	Introduction to Remote Sensing (TS)	
Select from as elective credits:		21
BIOL 2XXX		
BIOL 2XXX		

ENVR 2XXX		
ENVR 2XXX		
GEOG 1XXX		
REC 2XXX		
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 3020	Extended Field Topics in Environmental Science 1	
ENVR 2350	Technical Communication in the Environmental Sectors	
Hours		33
Total Hours		90

¹ The former CHEM 1300 and CHEM 1310 may be used in lieu of CHEM 1100, CHEM 1110, and CHEM 1120. CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120.

² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500 (or equivalent).

³ STAT 1150 and STAT 2150 may be used in lieu of STAT 1000 and STAT 2000.

⁴ The former ENVR 2170 or the former ENVR 2270 may be used in lieu of ENVR 2810.

⁵ The former ENVR 2650 may be used in lieu of ENVR 3160.

⁶ PHYS 1050 and PHYS 1070 may be used in lieu of PHYS 1020 and PHYS 1030.

⁷ MATH 1310 and MATH 1710 may be taken in place of MATH 1300 and MATH 1700 (or equivalent).

⁸ Focus Area performance requirements are defined in Minimum Performance Requirements for Continuation and Graduation (<https://catalog.umanitoba.ca/undergraduate-studies/environment-earth-resources/environment-geography/environmental-science-benvsc-honours/#Minimum-Performance-Requirements>). Information on Focus Areas is available in the Focus Area Brochure.

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