

# Environmental Health Option, Microbiology

11/11/18

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Freshman Year	Credits
<u>CHMY 141</u> – College Chemistry I (F)	4
<u>WRIT101W</u> - College Writing I (or test out of this requirement)	3
<u>M151Q</u> - Pre-calculus (F, S, Su) Or <u>M161Q</u> - Survey of Calculus ((F, S, Su) Or <u>M171Q</u> - Calculus I (F, S, Su)	4
CORE or Elective 4-5	
<u>BIOB 160</u> - Principals of Living Systems (F, S) or <u>BIOB 260</u> - Cellular and Molecular Biology (F, S)	4
<u>CHMY 143</u> - College Chemistry II (F, S, SU)	4
<u>GPHY 284</u> - Intro to GIS (F, S)	3
<u>CORE</u> (University Seminar)	3
<u>CORE</u> or <u>Elective</u>	2-3
<b>Year Total:</b>	<b>30-32</b>

Sophomore Year	Credits
<u>BIOM210RN</u> -Principals of Environmental Health Science (F)	3
<u>CHMY 211</u> - Organic Chemistry (F, S) Or <u>CHMY 321</u> - Organic Chemistry I (F, Su)	4-5
<u>PHSX 205</u> – College Physics I (F, S, Su)	4
<u>NRSM 240</u> - Natural Resource Ecology (F) or <u>NRSM 101</u> - Natural Resource Conservation (F) or <u>BIOE 370</u> - Ecology (F, S) or <u>BIOM 415</u> - Microbial Diversity, Ecology, Evolution (S, even years)	3
<u>KIN 221</u> - Health Anatomy and Physiology (F, Su) or <u>BIOH 211</u> Anatomy & Physiology II (F, S) or <u>ANSC 265/266</u> Anatomy & Physiology of Domestic Animals (S)	3-4
<u>HDFS 271</u> - Statistical Measures of Well Being(S) or <u>BIOB 318</u> - Biometry (S) or <u>STAT 216</u> - Intro to Stats (F, S, Su)	3
<i>One of:</i> <u>CULA 105</u> – Food Safety & Sanitation (F) or <u>BIOM 250</u> Microbiology for Health Sciences: Infectious Diseases (F, S) or <u>BIOM460</u> Infectious Diseases Ecology & Spillover (F, in senior year after BIOM360)	2-3
CORE and/or Electives	5-6
<b>Year Total:</b>	<b>30-32</b>

Junior Year	Credits
<u>BIOM 360</u> - General Microbiology (F, S)	5
<u>MBEH 498</u> - Environmental Health Internship	3

<u>CORE</u> and/or <u>Electives</u>	2
<u>EENV 447</u> - Hazardous Waste Management (S)	3
<u>CORE</u> and/or <u>Electives</u>	8
<b>Year Total:</b>	<b>30</b>

<b>Senior Year</b>	<b>Credits</b>
<u>BIOM 494</u> Seminar (Environmental Health Management/Capstone)	1
<u>CHTH 440</u> Principals of Epidemiology (F)	3
<u>ENSC 407</u> - Environmental Risk Assessment (F, alternate years)	3
<u>CORE</u> and/or <u>Electives</u>	9
<u>BIOM 494</u> Seminar (Capstone) Or <u>MBEH 490R</u> Research (Capstone)	1-3
<u>BIOM 425</u> - Toxicology (S)	3
<u>CORE</u> and/or <u>Electives</u>	9-11
Year Total:	30
<b>Total Program Credits:</b>	<b>120</b>

**Electives (12 cr. or more from this list. A minimum of 120 credits is required for graduation, with  $\geq 42$  course credits at 300 level or above)**

**Recommended electives**

<u>CULA 105</u> – and/or <u>BIOM 250</u> and/or <u>BIOM 460</u>	Food Safety & Sanitation (F) Microbiology for Health Sciences: Infectious Diseases (F, S) Infectious Diseases Ecology and Spillover (F) ( <i>whichever courses were not taken above</i> )	2-3
<u>MBEH 2XX</u>	HAZWOPER (Hazardous Waste Operations & Emergency Response)	2
<u>BIOM 430</u>	Applied and Environmental Microbiology	4
<u>LS 191</u>	Introduction to Global Health (F)	3
<u>ENSC 272</u>	Water Resources (F)	3
<u>ENSC 245</u>	Soils (F)	3
<u>ARCH 231</u>	Issues in Sustainability	3
<u>WRIT 221</u> or <u>WRIT 326</u>	Intermediate Tech Writing (F, S) Advanced Writing (F)	3

**Electives: Other**

<u>MBEH 291</u>	Special Topics in Environmental Health	1-4
<u>MBEH 475</u>	Field Project in Environmental Health	1-4
<u>MBEH 490R</u>	Undergraduate Research	1-6
<u>MBEH 492</u>	Independent Study	1-3
<u>MBEH 4XX</u>	Water and Wastewater Microbiology (planned)	3
<u>MBEH 4XX</u>	Occupational Health and Safety (planned)	3

**Electives: Other (cont'd.)**

<u>AGSC 465R</u>	Health, Agriculture and Poverty (F,S)	4
<u>BCH 380</u>	Biochemistry	5
<u>BIOH201</u>	Human Anatomy & Physiology I (F)	5
<u>BIOH 303</u>	Global Diseases and Health Disparities (S)	3
<u>BIOM 400</u>	Medical Microbiology (S)	3
<u>BIOB 410</u>	Immunology	3
<u>BIOM 405</u>	Host Associated Microbiomes	3
<u>BIOM 410</u>	Microbial Genetics	3
<u>BIOM 435</u>	Virology	3
<u>BIOM 450</u>	Microbial Physiology	3
<u>BIOM 452</u>	Soil and Environmental Microbiology (S)	3
<u>BIOO 262 IN</u>	Intro to Entomology	3
<u>BMGT 235</u>	Management (F)	3
<u>CHEM323</u>	Organic Chemistry II	4
<u>ENSC 353</u>	Environmental Biogeochemistry	3
<u>ENSC 444</u>	Watershed Hydrology (F)	3
<u>ENSC 460</u>	Soil Remediation (S)	3
<u>ENSC 461</u>	Restoration Ecology	3
<u>ERTH 101N</u>	Earth System Sciences (no longer required by Accreditation)	4
<u>GPHY 357</u>	GPS Fund/App Mapping (F)	3
<u>GPHY 384</u>	Advanced GIS and Spatial Analysis (F/S)	3
<u>GPHY 402</u>	Water & Society	3
<u>NASX 310</u> or <u>NASX 450</u>	Native Cultures in North America History of American Indians	3
<u>NASX 415</u>	Native Food Systems	3
<u>NASX 476</u>	American Indian Policy and Law	3
<u>NRSM 430</u>	Natural Resource Law	3
<u>NUTR 221</u>	Basic Human Nutrition (F, S, Su)	3
<u>NUTR 226</u>	Food Fundamentals (S)	3
<u>NUTR 227</u>	Food Fundamentals Lab (F,S)	2
<u>NUTR 322</u>	Food Service System Management (F)	3
<u>PHSX 207</u>	College Physics II	4
<u>STAT 217Q</u>	Intermediate Statistical Concepts	3

<u>STAT 411</u>	Methods for Data Analysis I	3
<u>STAT 412</u>	Methods for Data Analysis II	3

Alternate courses possible with advisor approval.

### **Suggested Elective Groups**

#### Communicable Disease Management

<u>BIOM 250</u>	Microbiology for Health Sciences: Infectious Diseases (F, S) ( <i>if not taken above</i> )	3
<u>BIOM 460</u>	Infectious Diseases Ecology and Spillover (F) ( <i>if not taken above</i> )	3
<u>BIOB 410</u>	Immunology	3
<u>BIOM 400</u>	Medical Microbiology (S)	3
<u>BIOM 435</u>	Virology	3

#### Pre-medicine

<u>BCH 380</u>	Biochemistry	5
<u>PHSX 207</u>	College Physics II	4
<u>CHEM323</u>	Organic Chemistry II	4

#### Water & Wastewater Management (4 of these courses)

<u>ENSC 245</u>	Soils (F)	3
<u>ENSC 272</u>	Water Resources (F)	3
<u>BIOM 452</u>	Soil & Environmental Microbiology	3
<u>ENSC 353</u>	Environmental Biogeochemistry	3
<u>ENSC 444</u>	Watershed Hydrology (F)	3
<u>GPHY 384</u>	Advanced GIS and Spatial Analysis (F/S)	3
<u>MBEH 4XX</u>	Water and Wastewater Microbiology (planned)	3
Plus: <u>MBEH498</u>	Required internship focused on water and/or wastewater	3

NOTE: Students can earn the Water Resources Minor with just an additional 3 courses. See <http://www.montana.edu/water-resources-minor/>.

#### Food Safety & Management (12 credits from the following)

<u>CULA 105</u> – or <u>BIOM 250</u>	Food Safety & Sanitation (F)	2-3
<u>NUTR 221</u>	Microbiology for Health Sciences: Infectious Diseases (F, S) ( <i>if not taken above</i> )	3
<u>NUTR 226</u>	Basic Human Nutrition (F, S, Su)	3
<u>NUTR 227</u>	Food Fundamentals (S)	3
<u>NUTR 227</u>	Food Fundamentals Lab (F,S)	2
<u>NUTR 322</u>	Food Service System Management (F)	3
<u>NASX 415</u>	Native Food Systems	3

#### Occupational Health and Safety

<u>MBEH 4XX</u>	Occupational Health and Safety (planned)	3
<u>MBEH 3XX</u>	HAZWOPER (Hazardous Waste Operations & Emergency Response) (TBD)	2
<u>BMGT 235</u>	Management (F)	3
<u>BMGT 335</u>	Management and Organization (F, S, Su)	3

#### Epidemiology

<u>STAT 217Q</u>	Intermediate Statistical Concepts	3
<u>STAT 411</u>	Methods for Data Analysis I	3
<u>STAT 412</u>	Methods for Data Analysis II	3

#### Toxicology

<u>BIOB 410</u>	Immunology	3
<u>BCH 380</u>	Biochemistry	5
<u>BIOH 201</u>	Human Anatomy & Physiology I (F)	5

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Global Environmental Health (12 credits from this list):

<u>LS 191</u>	Introduction to Global Health (F)	3
<u>BIOH 303</u>	Global Diseases and Health Disparities (S)	3
<u>AGSC 465R</u>	Health, Agriculture and Poverty (F,S)	4
<u>GPHY 402</u>	Water & Society	3
Language class		3

NOTE: Students can earn the Global Health minor with just an additional 9 credits. See <http://www.montana.edu/liberalstudies/global-health.html>.

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Environmental Health in Native American Communities

<u>NASX 310</u>	Native Cultures in North America	
or <u>NASX 450</u>	History of American Indians	3
<u>NASX 415</u>	Native Food Systems	3
<u>NASX 476</u>	American Indian Policy and Law	3
<u>AGSC 465R</u>	Health, Agriculture and Poverty (F,S)	4

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Environmental Health in Hispanic Communities

<u>SPNS 250</u>	Spanish for Healthcare Professionals	3
<u>SPNS 350</u>	US Latino Cultures	3
<u>SPNS 496</u>	Service/Experiential Learning	