ENSP – Global Environmental Change

Updated 11.1.23 - ABM

NOTE: always refer to the Schedule of Classes on Testudo for the most up-to-date information regarding course offerings, prerequisites and restrictions.

ENSP Core

Course	Title	Offered	Grade
All three:			
ENSP101 (NS)	Intro to Env Science	Fa	
ENSP102 (HS)	Intro to Env Policy	Sp	
ENSP400 (SP)	Senior Capstone	Fa,Sp	
Applied Science and Policy (one)			
ENSP305	Applied Spatial Methods	Sp	
ENSP306	Qual Research/Env Sci	Fa	
ENSP330	Environmental Law	Fa, Sp	
ENSP340	Sci, Ethics, Law: Water	Fa	
ENSP342	Oceans: Integ. Policy	Sp	
ENSP350	Energy: Science & Policy	TBA	
ENSP370	Environmental Justice	Sp	
Calculus (pick one)			**Grade**
MATH120 (MA) or	Elementary Calculus	Fa,Sp,Su	
MATH140 (MA)	Calculus I *(strongly recommended)*	Fa,Sp,Su	
Statistics (pick one)			**Grade**
BIOM301 (AR)	Intro to Biometrics	Fa,W,Sp	
GEOG306 (AR) **	Intro to Quant Methods	Sp,Su,W	
PSYC200 (AR)	Stat Methods in Psyc	Fa,Sp,Su	
** *strongly recommended*			

<u>One</u> course from <u>each</u> group below:

Biology			**Grade**
BSCI160/161 (NL)	Ecology & Evolution/Lab	Fa,Sp,Su	
Chemistry			**Grade**
CHEM131/132 (NL)	Gen Chemistry I/Lab	Fa,Sp,Su	
Earth Sci			**Grade**
GEOG201/211 (NL)	Geog Environ Sys/Lab	Fa,Sp,Su	
Economics (pick one)			
AREC240 (HS)	Intro to Econ and Env	Sp	
AREC241 (HS, IS)	Env, Econ, and Policy	Fa	
ECON200	Princ of Microeconomics	Fa, Sp, W	
Geography (pick one)			
GEOG130 (HS)	Developmental Geography	Fa,Su	
GEOG140 (IS)	Natural Disasters	Fa, Sp	
GEOG170 NS)	Meth of Geospatial Anal	Fa	
GEOG202 (CC)	Intro to Human Geog	Sp	

ENSP Graduation Requirements

_____ Students must earn <u>C- or higher</u> in all courses used for ENSP Core and Concentration requirements.
_____ Students' major GPA must be 2.0 or higher.

General Education

Fundamental Studies (15 credits)

Requirements	Course	Cr
Academic Writing (AW)		3
Professional Writing (PW)		3
Oral Communication (OC)		3
Math (MA)	Calculus	3-4
Analytical Reasoning (AR)	Statistics	

Distributive Studies (25 credits)

Requirements	Course	Cr
Natural Sciences w/Lab (NL)	ENSP Lab Sci	4
Natural Science (NS)	ENSP 101	3
History and/or Social Sci (HS1)	ENSP 102	3
History and/or Social Sci (HS2)		4
Humanities (HU1)		3
Humanities (HU2)		3
Scholarship in Practice (SP, major)	ENSP 400	3
Scholarship in Practice (SP, non-major)		3

I-Series (6 credits)*

* May double-count with Distributive Studies

Requirements	Course	Cr
I- Series (IS)		3
I- Series (IS)		3

Diversity (4-6 credits)*

* May double-count with Distributive Studies

Requirements	Course	Cr
Understanding Plural Societies (UP)		3-6
Understanding Plural Societies (UP) *or* Cultural Competency (CC)		0-3

Experiential Learning (0-3 credits)*

* May overlap with major requirements

Requirements	Course	Cr
Practical experience is *required* in this concentration		

Graduation Requirements

_____ <u>Up to 6 AP courses</u> **may** be used for Gen Ed
_____ No more than 60 credits earned from Community College
_____ Last 30 credits must be earned at Maryland
_____ 120+ cumulative credits *and* 2.0+ cum GPA

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REQUIREMENTS:

>>> LOWER LEVEL requirements (5 course, 18-19 credits):

Course	Description	Cr	Offered	Prerequisites	Grade
GEOL 100	Introduction to Geology	3	F, Sp, Su		
MATH 141 *or* MATH 121	Calculus II *[strongly recommended] or* Elementary Calculus II	4 3	F, Sp, Su F, Sp, Su	MATH 140 MATH 220	____ ____
PHYS161/174 *or* PHYS 121	Gen Phys: Mechanics and Particle Dyn /Lab Fund of Physics	3/1 4	F, Sp F, Sp	MATH141 MATH 115	____ ____
CHEM 231/232	Organic Chemistry I	4	F, Sp, Su	CHEM 131/132	____
ENST 200 *or* GEOL 102	Introduction to Soil Science* *or* Historical Geology	4 4	Fa, Sp Sp	CHEM 131/132 GEOL 100	____ ____

>>> UPPER LEVEL requirements (6 course, 18-19 credits): Special care needs to be taken in planning your junior and senior years, as many courses and their pre-requisites are offered only once annually. Please see your advisor for help with this as early as possible! Courses cannot double-count with ENSP Applied Science and Policy course.

Course	Description	Cr	Offered	Prerequisites	Grade
GEOG415 *or* BSCI 361	Land Use, Climate Change, and Sustainability *or* Principles of Ecology	3 4	Sp Fa, Sp	GEOG306; or permission BSCI 160/161 and MATH140	____ ____
GEOG 331	Intro to Hum Dimen of Global Chng	3	Sp	GEOG 201 or GEOG 202	
GEOG 301	-Adv Geographical Environmental Systems	3	S	GEOG201	
GVPT 306 *or* ENSP340 *or* ENSP342 *or* ENSP350	Global Ecopolitics *or* Science, Ethics, and Policy of Water Env Threats to Oceans and Coasts: Energy Resources: Science and Policy	3 3 3 3	Fa,Sp,Su F Sp TBA	GVPT 200 60 credits; ENSP101 and 102 60 credits; ENSP101 and 102 60 credits; ENSP101 and 102	____ ____
GEOG 442 *or* AOSC 400 *or* GEOL 437	Biogeography and Enviro. Change *or* The Atmosphere *or* Global Climatic Chng: Past and Pres	3 3 3	F F Sp, even # years	GEOG301, GEOG201/211; or perm. MATH 140 CHEM 131/132, MATH 140, GEOL 100	____ ____ ____
ENSP 386	Internship	3-6	F, Sp, Su	Perm.	

>>> TECHNIQUES & METHODS (3 courses, 9 credits): Select at least 3 courses and 9 credits in consultation with your advisor. Selections must be approved in advance.

Course	Description	Cr	Offered	Prerequisites	Grade
GEOG 272	Introduction to Earth Observation Science (Formerly GEOG372: Remote Sensing)	3	F, Su, W		
GEOG 276	Principles of Python & Geocomputing	3	F, Su		
GEOG 373	Geographic Information Systems	3	F,Sp,W, Su		
GEOG 371	Programming for Image Analysis	3	F	GEOG276, GEOG306, and GEOG272.	
GEOG 376	Programming for Geospatial Analysis	3	Sp	GEOG276 and GEOG373, Calc	
GEOG 398E	Spatial Artificial Intelligence	3	Sp		
GEOG 418	Field & Lab Techniques in Env Science	3	F	*The field component is taught in Sum Session; check Sched of Classes*	
GEOG 470	Algorithms for Geospatial Computing	3	Sp	GEOG276	
GEOG 472	Advanced Remote Sensing	3	F	GEOG 372	
GEOG 473	GIS & Spatial Analysis	3	Sp	GEOG 373	
GEOG475	Geographic Visualization & Digital Mapping	3	F	GEOG373 and GEOG306.	
MATH 240	Introduction to Linear Algebra	4	F, Sp, Su		
MATH 246	Differential Equations	3	F, Sp, Su	MATH 141 and 240 or PHYS 161	
MATH 241	Calculus III	4	F, Sp, Su		
PHYS 165	Intro to Programming in the Phys Sci	3	F	PHYS 141 or Physics AP score 3+	

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RESTRICTED ELECTIVES (3 courses, 9 credits): Select at least 6 credits from one area and 3 credits from the other. Also, course selections may not "count" twice, e.g., once in "Upper Level Requirements" and again in "Restricted Electives." **Students may suggest additions to this list by bringing a course syllabus to the faculty advisor and explaining how the course relates to their long-term academic or career interests.**

>>> Area 1 - Physical and Biological Components

Course	Description	Cr	Offered	Prerequisites	Grade
AOSC 400	The Atmosphere	3	F	MATH 141, PHYS 161 or 171, or perm.	
AOSC 401	Global Environment	3	Sp	AOSC 400	
AOSC 434	Air Pollution	3	Sp	CHEM 113 and MATH 241 or perm.	
BSCI 460 *or* BSCI 462	Plant Ecology Population Ecology	3 3	F F	BSCI 160/161 BSCI 160/161 and MATH 220	____ ____
ENST 450	Wetland Ecology	3	F	BIOM 301.	
GEOG 301	Adv Geographical Environmental Systems	3	Sp		
GEOG 340 *or* GEOL 340	Geomorphology *or* Geomorphology	3 4	TBA Sp	GEOG 201 GEOL 100 or GEOL 120	____ ____
GEOG 417	Land Cover Ch. Multi-Spect./Rem Sensing	3	Sp	GEOG272, GEOG472 & GEOG306 or perm	
GEOG 440	Polar Remote Sensing	3	Sp	GEOG301 or GEOG276	
GEOG 441	The Coastal Ocean	3	Sp	GEOG 201.	
GEOG 442	Biogeography and Environmental Change	3	F	GEOG301, GEOG201/211; or perm.	
GEOL 437	Global Climatic Chng: Past and Present	3	Sp	CHEM 103, MATH 140, GEOL 100	
GEOL 444	Low Temperature Geochemistry	3	F	GEOL 100/110, GEOL 322, CHEM 131/132, MATH115 or perm.	
GEOL 452	Watershed and Wetland Hydrology	3	F	MATH 140, GEOL 100, CHEM 131/132, or perm	
GEOL453	Restoration Ecology	3	F	BSCI 160/161	
ENST 479	Tropical Ecology and Resource Mgt	3	Sp	BSCI 160/161. *Course has required travel-study component.*	
PLSC 471	Forest Ecology	3	Sp	BSCI 160/161	

>>> Area 2 - Human Dimensions

Course	Description	Cr	Offered	Prerequisites	Grade
ANTH 450	Environmental Anthropology	3	S	Jr. standing	
AREC 453	Natural Resources and Public Policy	3	F	ECON200, 201, and AREC 326	
AREC 454	Economics of Global Change	3	Sp	ECON200, 201, and AREC 326	
AREC 455	Economics of Land Use	3	F	ECON200, 201, and AREC 326	
GEOG 330	Society and Sustainability (Gen Ed UP, IS)	3	F		
GEOG 331	Introduction to Human Dimensions of Global Change	3	Sp	ANTH220, ANTH260, GEOG202, or GEOG201; or perm	
GEOG 333	The Social Geography of Metropolitan Areas in Global Perspective	3	Sp	GEOG201 and GEOG202; or perm	
GEOG 430	Climate, Energy, and Policy	3	F	GEOG201, GEOG202; and GEO306 & GEOG301, or perm.	
GEOG 498B	Coupled Human & Natural Systems	3	F		
GVPT 306	Global Ecopolitics	3	F	GVPT 200	
ENST 440	Crops, Soils and Civilization	3	Sp		
ENST 441	Sustainable Agriculture	3	F		
SOCY 305 or SOCY 405	Scarcity and Modern Society Scarcity and Modern Society (seminar)	3 3	Sp Sp	3 cr. in SOCY or ENSP 102 or perm. 3 cr. in SOCY or ENSP 102 or perm.	

Advisor notes, approved course substitutions, etc: