Geography-Earth Science
Undergraduate Scheduling Information
October 2020

SHIPPENSBURG UNIVERSITY

Key steps in registering for Winter / Spring classes

1. Review the registration process.

2. Scheduling for Winter (online) and Spring terms begins on Monday, October 26, 2020 and ends on Thursday November 12, 2020. Be aware of your registration time window:

   - Log in to myShip.
   - Click on **Student.**
   - Click on **My Academics.**
   - Under **Registration Tools**, click on **Prepare for Registration.**
   - Select the appropriate term.
   - Look for registration window information.

3. Check your progress using Degree Audit.

4. Review major and minor degree requirements using check sheets (in this packet) and/or Degree Audit.

5. Schedule an appointment with your Academic Advisor (see contact information in this packet). Students ***must*** see their academic advisor to obtain their registration PIN – you cannot register without this PIN.

6. Consider any holds and financial aid issues.
   - Log in to myShip
   - Select **My Academics** from the **Student** tab**.**
   - Under **Registration Tools**, click on **My Holds.**
   - If you have a hold, contact the office listed on the Types of Holds page to clear the hold from your record.

7. Prepare a list of classes and alternative options (see worksheet in this packet).

8. Consider course availability in future semesters as well (some courses are not offered every semester – see some key examples below).

9. If you have any problems with scheduling, please contact Tammy Myers (Dept. Secretary, Shearer Hall 104) or Dr. Woltemade (Dept. Chair).

Adding the GIS certificate, a minor, or changing your major

- Review information on this site and submit the "Declare/Change Undergraduate Major/Minor/Other Credentials" web form.
- Note: Financial aid may not cover courses in the GIS certificate. Please check with the financial aid office for assistance.

Key scheduling issues for Geography-Earth Science undergraduate majors

All GEO-ESS majors:

1. **GEO 391 Geography Seminar** – offered spring 2021 but NOT in fall 2021
   If you need this class to graduate in December 2021, enroll for spring 2021.

2. **CHM 121: Chemical Bonding**
   CHM 122: Chemical Dynamics
   Students must take assigned labs (CHM 125, 126) with Chemical Bonding and Chemical Dynamics.

3. **PHY 121: Introduction to Physics I** - fall only
   PHY 122: Introduction to Physics II – spring only
   Students must take assigned labs (PHY 123) with Intro to Physics I.

4. Two basic Biology courses are offered: BIO 161: Principles of Biology: Cell Structure and Function BIO 162: Principles of Biology: Organismal Diversity.
   All Geography-Earth Science Majors should take BIO 162: Organismal Diversity.

5. Developmental courses count toward your QPA, **but credits earned in these courses do not count for graduation**.
   MAT 050: Developmental Math
   RDG 050: Developmental Reading
   ENG 050: Basic Writing
   For example, if you take Developmental Math, you need 123 hours for graduation.

6. All grades earned in performance classes (e.g. music) count toward your QPA, **but only a maximum of 3 credits count toward graduation.**

Pre-requisites to enroll in key GEO-ESS courses

GEO 202	GIS-1	Must have earned a minimum of 15 credits
GEO 224	Soils	Passed ESS 110 or ESS 210
GEO 226	Hydrology	Complete gen ed math requirement (e.g. MAT 140)
GEO 363	GIS-2	Passed GEO 202 (GIS-1) with minimum grade of C
GEO 420	GIS-3	Passed GEO 363 (GIS-2) with minimum grade of C
GEO 391	Seminar	Senior standing (Tammy Myers must add you to this course)
GEO 397	Intro to Research	Minimum 60 credits and faculty advisor approval (Tammy Myers must add you to this course)

Geoenvironmental Studies majors

Geology: If you have taken ESS 110: Intro to Geology, you should *not* take ESS 210: Physical Geology. You should fulfill the geology requirement with: ESS 212: Historical Geology, ESS 214: Geology of National Parks, or GEO 306: Geomorphology.

Atmosphere: If you have taken ESS 111: Intro to the Atmosphere, you should *not* take ESS 355: Meteorology. You should fulfill the atmosphere requirement with: GEO 203: Climatology or ESS 404: Applied Meteorology and Climatology.

Math: MAT 117: Applied Statistics is recommended for the math requirement.

Biology: You need to take 3 Biology courses with at least one at the 200+ level.
BIO 162 must be taken before scheduling a 200 level or higher BIO course.
The recommended 200-level course is BIO 242 Ecology (3 credits, including lab).

Chemistry / Physics: For this requirement, you must take either two Chemistry courses (with lab) or one Chemistry course plus on Physics course (with lab).
Recommended courses:
CHM 105: Chemistry – An Observational Approach (offered fall and spring)
CHM 121: Chem Bonding (plus CHM 125 Lab IB) (fall only)
PHY 121: Intro to Physics I (plus PHY 123 Lab) (fall only)

Geography - GIS majors

Python: CSC 104: Programming in Python should be taken for the Natural World - Technology general education course.

Earth-Space Science or Comprehensive Social Studies/Geography majors

Advising: Please see Dr. Smith for scheduling.
Instructions are complicated for these certification programs.

Chemistry: Earth-Space Science Education Majors must take 8 credits:
CHM 121: Chemical Bonding
CHM 125: Lab IB Stoichiometry & Reactions
CHM 122: Chemical Dynamics
CHM 126: Lab IIB Equilibrium & Instrumentation

Physics: Earth-Space Science Education Majors must take 8 credits:
PHY121: Introductory Physics I (plus PHY 123: Physics Lab)
PHY 122: Introductory Physics II (plus PHY 125: Physics Lab)

Honors Students

Advising: Please be sure to meet with your advisor as early as possible before scheduling.

Geography – Earth Science Course Information for Winter 2020 / Spring 2021

Winter 2020 (Online) Courses

ESS 108	Intro to Enviro Sustainability	Dr. Hawkins
ESS 110	Intro to Geology	Dr. Woltemade
GEO 101	World Geography	Dr. A. Feeney
GEO 140	Human Geography	Dr. Fuellhart

Spring 2021

Drs. Fuellhart and Hawkins will be on sabbatical leave, so some courses will not be offered:

GEO 140	Human Geography
GEO 230	Economic Geography
GEO 310	Transportation Geography
ESS 355	Meteorology

For the most up-to-date listing of course offerings, please check Banner.

Spring 2021 GEO-ESS Courses

General Education Courses:

ESS 108	Intro to Enviro Sustainability	4 sections
ESS 110	Intro to Geology	6 sections
ESS 111	Intro to Atmosphere	3 sections
GEO 101	World Geography	5 sections
GEO 103	Geography US and Canada	7 sections

Techniques Courses:

GEO 202	GIS-1	2 sections
GEO 363	GIS-2	2 sections
GEO 420	GIS-3	1 section
GEO 425	Image Processing	1 section
GEO 441	Quantitative Methods	1 section

Upper-level Courses

ESS 212	Historical Geology	1 section
ESS 442	Environmental Geology	1 section
GEO 224	Soils	1 section
GEO 226	Hydrology	1 section
GEO 244	Land Use	1 section
GEO 322	Urban Geography	1 section
GEO 391	Seminar	1 section
GEO 402	Medical Geography	1 section
GEO 427	Environmental Sustainability	1 section
GEO 535	Karst Hydrology	1 section
GEO 542	Land Use Regulation	1 section

Courses by advisement (minimum 60 credits, GPA 2.0)

GEO 360 Internship *[See important instructions below]*

GEO 397 Intro to Research *[Requires advance planning with a faculty advisor and syllabus required before registration can take place.]*

Internship Information

A basic outline of the most critical internship information is below. It is essential that you review the department internship web page for more detailed information.

Undergraduate students:

- Must have earned at least **60 credits** with at least a **2.0 overall GPA**.
- A minimum of **3 credits** of internship are required (maximum of 9 credits allowed).

Graduate students:

- Minimum GPA of 3.0 required to take an internship.
- Non-thesis graduate students must complete **6 credits** of internship; a maximum of six is allowed.

All students:

- The internship must relate to the student's major and educational background.
- During the advising period, consult with your faculty advisor about your interest in an internship.
- The prospective internship experience must be approved by the faculty coordinator**.**
- **A fully completed and signed "Letter of Agreement"** (also called an internship application form) **is required prior to registering for internship credits.** Students are fully responsible for completing this form and securing the signature of an appropriate organizational representative, as well as signing it themselves before presenting it to Dr. Pomeroy for his review and approval. Ask Dr. Pomeroy for assistance if you have questions about how to complete the "Letter of Agreement."
- All internships **must** also have an Affiliation Agreement in place between the University and the organization hosting the intern. You **must** consult with Dr. Pomeroy to see if there is an agreement already in place. If there is not an agreement in place, Dr. Pomeroy will contact the organizational representative for your prospective internship and work with you on this process. It is possible that the Associate Dean will not approve your internship until this agreement in fully in pace.
- Each credit hour of internship equates to 40 hours of work at your placement, so a 3-credit internship equals 120 hours of work.
- All internships are graded Pass/Fail.
- Your internship is an academic experience as well as a professional experience. As such, tuition will be charged for internship credits *just like any other academic course*. For information on tuition costs, see the Student Accounts website.

To register for your internship

- To apply for a **Fall or Summer** internship, submit your intent to apply by **March 15**.
- To apply for a **Spring** internship, submit your intent to apply by **October 15**.
- As already noted above, submit the completed "Letter of Agreement" noted above to Dr. Pomeroy for his review and approval. He will then send it for further review and approval by the Associate Dean of Arts and Sciences. After the Associate Dean approves the internship, Ms. Myers will register you for internship credits via Banner. This may require that you work closely with Dr. Pomeroy and Ms. Tammy Myers (477-1685). Please note that Ms. Myers will not register any student who does not have the required approvals.
- For questions about registration, contact Dr. Pomeroy (477-1776), Dr. Jantz (477-1399), or Associate Dean Dr. Lesley Brown (477-1151).

Geography – Earth Science Faculty contacts

Name	Office	Ext.	Email
Dr. Mike Applegarth	SRH 211	1712	mtappl@ship.edu
Dr. Sean Cornell	SRH 005A	1310	srcornell@ship.edu
Dr. Scott Drzyzga	SRH 208	1307	sadrzy@ship.edu
Dr. Allison Feeney	SRH 112	1319	aefeen@ship.edu
Dr. Thomas Feeney	SRH 106	1297	tpfeen@ship.edu
Dr. Kurtis Fuellhart	SRH 210	1309	kgfuel@ship.edu
Dr. Tim Hawkins	SRH 212	1662	twhawk@ship.edu
Dr. Russ Hedberg	SRH 101	1515	rchedberg@ship.edu
Dr. Claire Jantz	SRH 116	1399	cajant@ship.edu
Dr. Paul Marr	SRH 110	1656	pgmarr@ship.edu
Dr. George Pomeroy	SRH 113	1776	gmpome@ship.edu
Dr. Janet Smith	SRH 103	1757	jssmit@ship.edu
Dr. Christopher Woltemade	SRH 108	1143	cjwolt@ship.edu
Dr. Joseph Zume	SRH 111	1548	jtzume@ship.edu
Ms. Tammy Myers, secretary	SRH 104	1685	tlmyers@ship.edu

Key documents included below

Course Planner Worksheet

Major Checksheets

- Geoenvironmental Studies
- Geography-GIS
- Geography-Land Use
- Sustainability
- BS Education – Earth-Space Science
- BS Education – Comprehensive Social Studies

Minor Checksheets

- Geography (various tracks)
- GIS minor (and 12 credit GIS Certificate)
- Marine Science
- Sustainability

Geography-Earth Science Course Election Record
(Note: This form is to be used only as an aid when preparing your schedule)

NAME:_____ **SUID#**_____

MAJOR:_____

1) Students **must** meet with their academic advisor before scheduling to receive their PIN#. You will **not** be able to submit your schedule unless you have your PIN#.

2) Students can schedule using any computer that has access to Banner during their scheduling window.

3) Students **will not** be permitted to schedule if they have a hold (parking ticket, phone bill, physical examination for the Health Center, etc.). Holds must be cleared by the appropriate office (i.e. parking ticket – University Police) before your appointment time expires.

4) To add closed or restricted courses, students must go to the appropriate academic department office **during their appointment time** for an override code in Banner**.**

5) PRIMARY COURSE REQUEST

Dept. No.	Course No.	Section No.	Course Title	Time	M	T	W	Th	F	Credits

Total credits to be scheduled

ALTERNATE COURSE REQUESTS

Dept. No.	Course No.	Section No.	Course Title	Time	M	T	W	Th	F	Credits

GEOGRAPHY-EARTH SCIENCE PROGRAM

NAME:_____

GEOENVIRONMENTAL STUDIES MAJOR – B.S.

Geography-Earth Science (42+ Cr)

Geoenvironemtnal Core (15 Cr)

- ESS 355 Meteorology (if ESS111, see †)
- ESS 210 Phy. Geology (If ESS110, see ‡)
- GEO 224 Soils
- GEO 226 Hydrology
- GEO 391 Geography Seminar

Geography Electives (6 Cr)

- GEO 230 Economic Geography
- GEO 244 Land Use
- GEO 305 Geography of Europe
- GEO 308 Geography of Latin America
- GEO 310 Transportation Geography
- GEO 313 Geography of South-Southeast Asia
- GEO 314 Industrial Geography
- GEO 317 Geography of East Asia
- GEO 320 Historical Geography
- GEO 322 Urban Geography
- GEO 415 Regional Geographic Studies
- GEO 450 Geography-Geology Field Studies*

Geoenvironmental Complex Systems (9 Cr)

- ESS 404 Applied Meteorology/Climatology
- ESS 410 Sed Geology & Paleoenvironments
- ESS 413 Mineral and Rock Resources
- ESS 442 Environmental Geology
- ESS 452 Coastal Env Oceanography
- ESS 490 Selected Topics
- GEO 301 Introduction to Biogeography
- GEO 306 Geomorphology
- GEO 402 Medical Geography
- GEO 404 Hydrogeology
- GEO 421 Environmental Law
- GEO 444 Environmental Land Use Planning
- GEO 446 Water Resource Management
- GEO 450 Geography-Geology Field Studies*
- GEO 490 Selected Topics

Geoenvironmental Electives (3+ Cr)

- ESS 212 Historical Geology
- ESS 214 Geology of National Parks
- ESS 220 Oceanography
- GEO 203 Climatology
- GEO 306 Geomorphology
- GEO 397 Intro to Research
- GEO 450 Geography-Geology Field Studies*

Geoenvironmental Electives cont. (3+ Cr)

- GEO 490 Selected Topics
- Marine Science Consortium Course

Technique Electives (6+ Cr)

- GEO 202 GIS I: Intro to GIS
- GEO 339 Remote Sensing
- GEO 352 Cartography
- GEO 363 GIS II: Intermediate GIS
- GEO 420 GIS III: Advanced GIS
- GEO 425 Image Processing
- GEO 440 Field Techniques
- GEO 441 Quantitative Methods
- GEO 463 Applied Geophysical Imaging

Internship (3+ cr)

- GEO 360 Internship (2.0 GPA, Junior status)

Allied Sciences (10+Cr)

(R) Recommended courses

Biology (6-7 Cr)

- BIO 142 Intro to Ecology
- (R) BIO 208 Field Biology
- BIO 210 Field Zoology (*162 req*)
- (R) BIO 242 Ecology (*162 req*)
- BIO 442 Aquatic Ecology (*162 req*)
- (R) BIO 448 Field Botany and Plant Tax (*162 req*)

Chemistry/Physics (4 Cr)

- CHM 121 Chemical Bonding
- CHM 125 Lab IB Stoichiometry and Reactions (1)
- CHM 122 Chemical Dynamics
- CHM 126 Lab IIB Equilibrium and Instruments (1)
- (R) PHY 121 Intro Physics (3) + 123 Lab (1)

*Only 3cr for category, 6cr total for major.

† If ESS111 taken, sub GEO203 or ESS404.

‡ If ESS110 taken, sub ESS212, GEO306 or ESS214.

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education classes that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	
Q	3	MAT 117

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	
G[b]	3+	
F	e	

[b] *At least 1 course each from D and G.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	
E	e	
R	e	

[c] *1 course from two different categories.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	BIO 162 and CHM 105
T	e	CSC 103 or 180

[d] *BIO 162 and CHM 105 required. Either CSC 103 or 180 also required.*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

February 12, 2020

GEOGRAPHY-EARTH SCIENCE PROGRAM NAME:_____

GEOGRAPHY, GEOGRAPHIC INFORMATION SYSTEMS MAJOR – B.S.

Geography-Earth Science (39+ Cr)

Required Geography Core (15 Cr)

- GEO 105 Physical Geography
- GEO 202 GIS I: Intro to GIS
- GEO 230 Economic Geography
- GEO 244 Land Use or 322 Urban Geography
- GEO 391 Geography Seminar

GIS Core Courses (12 Cr)

(all are required)

- GEO 339 Remote Sensing
- GEO 352 Cartography
- GEO 363 GIS II: Intermediate GIS
- GEO 420 GIS III: Advanced GIS

GIS Technical Electives (6 Cr)

(select 2)

- GEO 425 Image Processing
- GEO 440 Field Techniques I
- GEO 441 Quantitative Methods
- GEO 463 Applied Geophysical Imaging
- GEO 4____ Geography 400 Level Elective

Geography Content Electives (3cr)

(Select 1)

- GEO 244 Land Use
- GEO 301 Biogeography
- GEO 310 Transportation Geography
- GEO 322 Urban Geography
- GEO 427 Environmental Sustainability
- GEO 444 Env Land Use Planning

Internship (3+ Cr)

- GEO 360 Internship

Must have 2.0 overall and major GPA, and Junior status.

Allied Sciences (18 Cr)

Social Sciences (6 Cr)

(select 2)

- PHL 332 Ethical Issues and Comp Tech
- PLS 231 State and Local Government
- PLS 271 Introduction to Public Administration
- PLS 331 City Politics and Administration
- PLS 431 Pennsylvania Local Government
- SOC 220 Social Stratification
- SOC 346 City and Community
- SOC 363 Population Problems

Art/Computer Science/IMS (9+ Cr)

- ART 217 Computer Design I
- CSC 110 Computer Science I (3) + CSC 106 Lab (1)
- CSC 111 Computer Science II (4)
- CSC _____ by advisement
- MIS 142 Business Computer Systems
- MIS 240 Intro to Programming Concepts
- MIS 300 Info Tech and Business Operations
- MIS 355 Database Applications

Math (3+ Cr)

(select 1)

- MAT 140A College Algebra (4)*
- MAT 140B College Algebra (3)*
- MAT 175 Precaculus
- MAT 211 Calculus
- MAT 225 Discrete Mathematics

Technical Writing (3 Cr)

(required)

- ENG 238 Technical/Professional Writing

* MAT 140B is for students with a math placement level of 4 or higher and is the standard algebra course. MAT 140A is for students with a math placement level 3.

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education classes that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	
Q	3	**MAT 117**

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	
G[b]	3+	
F	e	

[b] *At least 1 course each from D and G.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	**PLS 100**
E	e	
R	e	**SOC 101**

[c] *PLS 100 and Soc 101 required.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	
T	e	**CSC 104**

[d] *At least 2 courses from N. CSC 104 required.*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

GEOGRAPHY-EARTH SCIENCE PROGRAM

NAME:_____

GEOGRAPHY, LAND USE MAJOR – B.S.

Geography-Earth Science (45+ Cr)

Required Geography Core (15 Cr)

- GEO 105 Physical Geography ☐
- GEO 202 GIS I: Intro to GIS ☐
- GEO 230 Economic Geography ☐
- GEO 244 Land Use or 322 Urban Geography ☐
- GEO 391 Geography Seminar ☐

Land Use Track Core (6 Cr)

(required)

- GEO 444 Env. Land Use Planning ☐
- GEO 441 Quantitative Methods ☐

Geography Content Courses

(select 5)

- ESS 214 Geology of National Parks ☐
- ESS 413 Mineral and Rock Resources ☐
- ESS 442 Environmental Geology ☐
- GEO 244 Land Use * ☐
- GEO 310 Transportation Geography ☐
- GEO 314 Industrial Geography ☐
- GEO 320 Historical Geography ☐
- GEO 322 Urban Geography* ☐
- GEO 326 Political Geography ☐

Techniques Electives (6 Cr)

(select 2)

- GEO 339 Remote Sensing ☐
- GEO 352 Cartography ☐
- GEO 363 GIS II: Intermediate GIS ☐
- GEO 420 GIS III: Advanced GIS ☐
- GEO 425 Image Processing ☐
- GEO 440 Field Techniques I ☐
- GEO 463 Applied Geophysical Imaging ☐

Internship (3+ Cr)

- GEO 360 Internship ☐

Must have 2.0 overall and major GPA, and Junior status.

*If not taken in Geography Core.

Allied Sciences (6+ Cr)

Political Science (6 Cr)

(select 2)

- PLS 231 State and Local Govt (*PLS 100 req*) ☐
- PLS 341 International Law (*PLS 141 req*) ☐
- PLS 431 PA Local Govt. (*9cr PLS courses*) ☐
- PLS _____ PLS course by advisement ☐

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education classes that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	
Q	3	**MAT 117**

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	
G[b]	3+	
F	e	

[b] *At least 1 course each from D and G.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	**PLS 100**
E	e	
R	e	

[c] *PLS 100 required. Other course must be from E or R.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	
T	e	**CSC 103 or 180**

[d] *Either CSC 103 or 180 required. At least 2 courses from N.*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

March 5, 2019

GEOGRAPHY-EARTH SCIENCE PROGRAM NAME:_____

SUSTAINABILITY MAJOR – B.S. *(with concentration in Environmental Conservation)*

Geography-Earth Science (42+ Cr)

Sustainability Core (6 Cr)
- ESS 108 Intro Env Sustain ***or*** BIO 145 Env Bio
- GEO 427 Environmental Sustainability

Concentration Core (9 Cr)
- GEO 202 GIS I: Intro to GIS
- GEO 230 Economic Geography
- GEO 391 Geography Seminar

Sustainability Systems (9 Cr)
- ESS 214 Geology of Nat Parks (ESS 110 or 210)
- ESS 404 Applied Meteor and Clim
- ESS 413 Rock and Min Res (ESS 110 or 210)
- ESS 442 Env Geology (ESS 110 or 210)
- ESS 451 Coastal Env Oceanography
- GEO 405 Environ. Conserv. and Mgmt. in PA
- GEO 444 Environmental Land Use Planning
- GEO 446 Water Resources Management
- GEO 450 Geography-Geology Field Study*, **

Human Sustainability Electives (6 Cr)
- GEO 140 Cultural Geography
- GEO 244 Land Use
- GEO 310 Transportation Geography
- GEO 322 Urban Geography

Techniques Course Electives (9 Cr)
- GEO 339 Remote Sensing
- GEO 352 Cartography
- GEO 363 GIS II: Intermediate GIS
- GEO 420 GIS III: Advanced GIS
- GEO 425 Image Processing
- GEO 440 Field Techniques
- GEO 441 Quantitative Methods**
- GEO 450 Geography-Geology Field Study *, **
- GEO 463 Applied Geophysical Imaging

Internship (3+ Cr)
- GEO 360 Internship (2.0 GPA, Junior status)

*Only 3cr for category, 6cr total for major.

** Strongly recommended course.

Note: Prerequisits are in parentheses.

Allied Sciences (18+Cr)

** = Recommended

Biology (3 Cr)
- BIO 205 Marine Biology (BIO 162)
- BIO 210 Field Zoology (BIO 162)
- BIO 208 Field Biology (BIO 162)
- BIO 230 Botany (BIO 161, 162)
- BIO 242 Ecology** (BIO 162)
- BIO 245 Marine Ecology (BIO 162)
- BIO 442 Aquatic Ecology (BIO162)
- BIO 444 Conservation Biology (BIO 242)

Psychology and Sociology (6 Cr)
- PSY 350 The Psychology of Sustainability** (PSY 101)
- SOC 265 Global Society (SOC 101)
- SOC 346 City and Community (SOC 101)
- SOC 354 Social Move and Social Change (SOC 101)
- SOC 363 Population Problems (SOC 101)
- SOC 440 Leader in Global Society (SOC 101)

Economics and Business (3 Cr)
- ECO 345 The Eco of Growth & Develop (ECN 102)
- ECO 355 Environmental Economics** (ECN 102)
- MGT 447 Business and Society
- MIS 142 Business Computer Systems
- MIS 242 Design and Dev of User Info Sys (MIS 142)
- SCM 420 Global Logistics Systems (SCM 330 rec.)

English, History, and Communication (6 Cr)
- ENG 238 Technical Writing
- ENG 359 Native American Literature
- HCS 345 Environmental Communication**
- HIS 358 American Environmental History**

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education classes that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	
Q	3	MAT 117

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	PSY101 (or SOC101 in Cat R)
G[b]	3+	
F	e	

[b] *PSY101 (or SOC101 in Cat R) required. At least 1 course each from D and G.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	
E	e	
R	e	SOC101 (or PSY101 in Cat D)

[c] *SOC101 (or PSY101 in Cat D) required. At least 1 course each from two different categories.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	BIO162
T	e	ECN 102

[d] *BIO 162 and ECN 102 required. 1 additional courses from N.*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

March 5, 2019

GEOGRAPHY-EARTH SCIENCE PROGRAM

NAME:_____

EARTH-SPACE SCIENCE MAJOR – B.S.Ed.

Geography-Earth Science (24 Cr)

Earth Science Core (12 Cr)

- ESS 210 Physical Geology* ☐
- ESS 212 Historical Geology ☐
- ESS 220 Oceanography* ☐
- ESS 355 Meteorology* ☐

Earth Science Elective (6 Cr)

- ESS 108 Intro to Env Sustainability ☐
- ESS 214 Geology of National Parks ☐
- ESS 404 Applied Meteorology and Climatology ☐
- ESS 442 Environmental Geology* ☐
- GEO 202 GIS I: Intro to GIS ☐
- GEO 203 Climatology* ☐
- GEO 224 Soils* ☐
- GEO 226 Hydrology* ☐
- GEO 306 Geomorphology ☐
- GEO 339 Remote Sensing ☐
- GEO 352 Cartography ☐
- GEO 363 GIS II: Intermediate GIS ☐
- GEO 397 Intro to Research ☐
- GEO 420 GIS III: Advanced GIS ☐
- GEO 440 Field Techniques* ☐
- GEO 444 Env. Land Use Planning* ☐
- Marine Science Consortium (1-6cr) ☐

Professional Education Requirements (34 Cr)

(all are required)

- EEC 273 Intro to Exceptionalities ☐
- EEC 423 Effective Instructional Strategies ☐
- EEC 483 Assessing Child Exceptionalities ☐
- RDG 413 Teach Read to Eng. Lang. Learners ☐
- TCH 207 Org. and Psych. Found. In 2nd Edu. ☐
- EDU 440 Teaching Science 2nd School (4) ☐
- EDU 441 Curriculum and Eval in 2nd Science ☐
- EDU 495 Student Teaching/Prof Pract (12) ☐

All education majors must pass the 1st level PAPA assessments before earning 48cr of coursework. These basic skills tests must be passed before students are permitted to take any 300+ level education courses.

Allied Sciences (25+ Cr)

Biology (9 Cr by advisement)

- BIO 161 Prin of Bio: Cell Struct and Func (4) ☐
- BIO 162 Principles of Bio: Org Diversity (4) ☐
- BIO 145 Environmental Biology ☐
- BIO 242 Ecology (*prereq BIO 162*) ☐
- BIO 208 Field Biology (*prereq BIO 162*) ☐
- BIO 419 Ornithology (*prereq BIO 161 & 162*) ☐
- BIO 448 Field Bot & Plant Tax (*prereq BIO 162*) ☐

Chemistry (4 Cr)

- CHM 122 Chemical Dynamics (3) ☐
- CHM 126 Lab IIB Equilibrium and Instr (1) ☐

Physics (8 Cr)

- PHY 121 Intro to Physics I (3) ☐
- PHY 123 Lab (1) ☐
- PHY 122 Intro to Physics II (3) ☐
- PHY 125 Lab (1) ☐

Math (4+ Cr by advisement)

- MAT 211 Calculus I (4) ☐
- MAT 212 Calculus II (4) ☐

(prereq MAT 175 or placement level 6)

Recommended: General Science Cert. (39cr)

In order to complete a General Science Certification, students must take 1 of the following in addition to their Earth-Space program:

- CSC 103 Overview of Computer Science ☐
- CSC 180 Microcomputer Basic ☐
- EDU 420 Microcomputers in the Classroom ☐

Optional: Env Education Certificate (24 Cr)

*Courses listed as * fulfill elective req.*

Required

- EDU 410 Environmental Education Practicum ☐
- BIO 142 Intro to Ecology or 242 Ecology ☐
- BIO 208 Field Bio or 210 Field Zoo or 448 Field Bio ☐
- ESS 210 Physical Geol or 111 Intro Atmos ☐
- BIO 145 Env Bio or ESS 108 Con Nat Res ☐
- *An additional 9 Cr of related electives* ☐

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education courses that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	
Q	3	MAT 117

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	
G[b]	3+	
F	e	

[b] *At least 1 course each from D and G.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	ESS 108
E	e	
R	e	

[c] *1 course from two different categories.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	CHM 121, CHM 125, PHY 108
T	e	CSC 103

[d] *CHM 121, CHM 125, and PHY 108*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

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GEOGRAPHY-EARTH SCIENCE PROGRAM NAME:_____

SECONDARY EDUCATION MAJOR (Social Studies) – B.S.ED

Geography-Earth Science (18+ Cr)

Required Geography Core (9 Cr)

- GEO 101 World Geography ☐
- GEO 140 Human Geography ☐
- GEO 230 Economic Geography ☐

Electives in Geography (9 Cr)

- GEO _____ Geography: Regional Course ☐
- GEO _____ Geography: Topical Course ☐
- GEO _____ Geography: Topical Course ☐

Cognate Requirements (18 Cr)

Economics Requirements (3 Cr)

- ECN 102 Principles of Microeconomics ☐

Psychology Requirements (3 Cr)

- PSY 101 General Psychology ☐

History Requirements (3 Cr)

- HIS 202 Recent History of the United States ☐

Political Science Requirements (6 Cr)

- PLS 141 World Politics ☐
- PLS _____ *See department for appropriate course.* ☐

Additional Required Cognates (3 Cr)

- Select one 200-level course from HIS, PLS, ECO, or SOC ☐

Professional Ed Requirements (34 Cr)

Required:

- EEC 273 Intro to Exceptionalities ☐
- EEC 423 Effective Instructional Strategies ☐
- EEC 483 Assessing Child Exceptionalities ☐
- RDG 413 Teach Read to Eng. Lang. Learners ☐
- TCH 207 Org. and Psych. Found. In 2nd Edu. ☐
- EDU 412 Teaching Social Studies I ☐
- EDU 413 Teaching Social Studies II ☐
- EDU 495 Student Teaching/Prof Pract (12) ☐

All education majors must pass the first level PAPA assessments (reading, math, and writing) before earning 48 credits of course work and before taking any 300-level or higher education course.

Helpful Advising Hints

Take the folloing courses in Year1:

GEO 101 World Geography

ESS 110 Intro Geology or ESS 111 Intro Atmosphere

ECN 101 Principles of Microeconomics

PLS 100 U.S. Government and Politics

PSY 101 General Psychology

Optional

Geographic Information Systems Certificate

Required:

- GEO 202 GIS I: Introduction to GIS ☐
- GEO 363: GIS II: Intermediate GIS ☐

Select two:

- GEO 339 Remote Sensing ☐
- GEO 352 Cartography ☐
- GEO 420 GIS III: Advanced GIS ☐
- GEO 425 Image Processing ☐
- GEO 440 Field Techniques ☐
- GEO 441 Quantitative Methods ☐

General Education Requirements (45 CR)

Courses filled-in below are ***DIRECTED general education courses that MUST be taken for the major.*** All other general education courses can be chosen from the list on the back of this page.

Foundations [a] ***(15 cr total)***	Cr	Course(s)
U	3	
W	3	
O	3	
H	3	HIS 105
Q	3	MAT 117

[a] *One course in each area are required.*

Interconnections ***(9 cr total)***	Cr	Course(s)
D[b]	3+	GEO 103
G[b]	3+	ECN 101 and HIS 106
F	e	

[b] *GEO 103, ECN 101 and HIS 106 required.*

Citizenship[c] ***(6 cr total)***	Cr	Course(s)
S	e	PLS 100
E	e	
R	e	

[c] *PLS 100 required. Other course must be from E.*

Natural World ***(9cr total)***	Cr	Course(s)
N[d]	6+	ESS 110 or ESS 111
T	e	

[d] *ESS 110 or ESS 111 required. At least 1*

Creativity ***(6 cr total)***	Cr	Course
L[e]	3	
A	e	
C	e	

[e] *At least 1 L course.*

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GEOGRAPHY-EARTH SCIENCE PROGRAM Name:_____

Choose one track listed below

Geoenvironmental Minor (21 Cr)

Physical Components: Air (select 1)

- ESS 111 Introduction to Atmosphere
- GEO 203 Climatology
- ESS 207 Atmospheric Studies
- ESS 355 Meteorology
- ESS 404 Applied Meteorology*

Physical Components: Water (select 1)

- ESS 220 Oceanography *
- GEO 226 Hydrology

Physical Components: Land : (Select 1)

- ESS 110 Introduction to Geology
- ESS 210 Physical Geology

Techniques: (Select 1)

- GEO 202 GIS I
- GEO 363 GIS II*
- GEO 420 GIS III*
- GEO 425 Image Processing

Techniques (continued):

- GEO 440 Field Techniques
- GEO 441 Quantitative Methods
- GEO 445 Remote Sensing

Human Applications:

(Select 1)

- ESS 108 Conserv of Natural Resources
- GEO 224 Soils*
- GEO 306 Geomorphology

(Select 1)

- GEO 402 Medical Geography
- ESS 442 Environmental Geology*
- GEO 444 Env Land Use Planning

(Select 1)

- GEO 301 Introduction to Biogeography
- ESS 413 Mineral and Rock Resources*
- GEO 446 Water Resource Management

Geoscience Minor (21 Cr)

Earth Materials & Processes (select 1)

- ESS 110 Introduction to Geology
- ESS 210 Physical Geology

Required

- ESS 212 Historical Geology*

Physical Components: Air (select 1)

- ESS 111 Introduction to Atmosphere
- GEO 203 Climatology
- ESS 207 Atmospheric Studies
- ESS 355 Meteorology

Physical Components: Water (select 1)

- ESS 220 Oceanography*
- GEO 226 Hydrology

Human Applications: (select 1)

- GEO 224 Soils*
- GEO 306 Geomorphology*

Advanced Earth Processes (select 1)

- ESS 340 Marine Geology
- ESS 413 Mineral and Rock Resources*
- ESS 442 Environmental Geology*

Techniques: (Select 1)

- GEO 202 GIS I
- GEO 363 GIS II*
- GEO 420 GIS III*
- GEO 440 Field Techniques
- GEO 445 Remote Sensing

Urban and Rural Planning (21 Cr)

(Select 1)

- GEO 101 World Geography
- GEO 103 Geography of U.S. and Canada
- ESS 108 Conserv of Natural Resources

(select 1)

- GEO 230 Economic Geography
- GEO 310 Transportation Geography
- GEO 314 Industrial Geography
- GEO 322 Urban Geography

(both required)

- GEO 244 Land Use
- GEO 444 Env Land Use Planning

Technique Preparation: (select 3)

- GEO 202 GIS I
- GEO 363 GIS II*
- GEO 420 GIS III*
- GEO 425 Image Processing
- GEO 440 Field Techniques
- GEO 441 Quantitative Methods
- GEO 445 Remote Sensing

Note: at least 2 courses must be 300-400 level.

**** indicates course has prerequisit.***

World Regional Systems (21 Cr)

(required)		**(select 2)**	
GEO 101 World Geography		GEO 201 Geography of Latin America	
GEO 103 Geography of U.S. and Canada		GEO 213 Geography of South-South East Asia	
(select 3)		GEO 214 Geography of East Asia	
GEO 230 Economic Geography		GEO 217 Geography of Australia and Oceania	
GEO 310 Transportation Geography		GEO 305 Geography of Europe*	
GEO 314 Industrial Geography		GEO 440 Field Techniques	
GEO 320 Historical Geography			
GEO 322 Urban Geography			
GEO 326 Political Geography*			

Note: at least 2 courses must be 300-400 level.

**** indicates course has prerequisit.***

GEOGRAPHY-EARTH SCIENCE PROGRAM Name:_____

GIS Minor (18 Cr)

Required Courses

GEO 202 GIS I	
GEO 363 GIS II*	
GEO 420 GIS III*	

Allied Techniques (select 2)

GEO 339 Remote Sensing	
GEO 352 Cartography	
GEO 425 Image Processing	
GEO 440 Field Techniques	
GEO 441 Quantitative Methods	
Geo 463 Applied Geophysical Imaging	

* Course has a prerequisit.

Geo-ESS Courses (select 1)

ESS 210 Physical Geology	
ESS 220 Oceanography	
GEO 226 Hydrology	
GEO 230 Economic Geography	
GEO 244 Land Use	
GEO 301 Introduction to Biogeography	
GEO 310 Transportation Geography	
GEO 322 Urban Geography	
GEO 444 Environmental Land Use Planning	

Note: At least 2 courses within the minor must be from the 300-400 level.

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GEOGRAPHY-EARTH SCIENCE PROGRAM

Geographic Information Systems Certificate (12cr)

Student Name:

Required Courses:	Completed
GEO 202: GIS I - Introduction to Geographic Information Systems	
GEO 363: GIS II - Intermediate Geographic Information Systems	

Select 2 of the following courses:	
GEO 339: Remote Sensing	
GEO 352: Cartography	
GEO 420: GIS III: Advanced Geographic Information Systems	
GEO 425: Image Processing	
GEO 440: Field Techniques	
GEO 441: Quantitative Methods	
GEO 463: Applied Geophysical Imaging	

Adding a GIS Certificate to Your Degree Program

To add the 12 credit hour GIS certificate to your current degree program please visit the link below:
http://www.ship.edu/Registrar/Declaration_of_Study/

Scroll down to "Student Information":

1. Fill in your student information.

Under "Current Majors, Minors, or Certificates":

2. Check the box corresponding to your CURRENT major.
3. Check the box corresponding to your CURRENT minor, if applicable.
   (Select "None" if you do not have a minor)
4. Check the box corresponding to any of your CURRENT certificate programs.
   (Select "None" if you are not currently enrolled in a certificate program)

Under "Section II: Program of Study":

5. Scroll down to "Certificates to add:"
6. Check the box labeled: Geographic Information Systems (AS-UCRT-GECT)
7. Scroll down to the bottom of the page and click the **SUBMIT** button.

Adding a GIS Certificate and you are a Non-Degree student:

Please see the Admissions Office (Old Main office 105).

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Shippensburg University
Marine Science Minor Advising Worksheet

Why a Marine Science Minor? Some facts…

- The world ocean is the **single most important feature of our planet**! It exists at the nexus of the Earth's complex systems and it is critical that we understand its role on our planet.
- Oceans regulate climate, circulate massive quantities of water, gases, and heat around the globe, and **produce upwards of 85% of the oxygen we breathe**. Oceans also absorb many of the pollutants we emit including greenhouse gases and moderate our climate. Their vast biodiversity offers a frontier for novel medicines, and oceans provide the primary food supply for more than 1.5 billion people globally.
- The **world's oceans are Earth's most valuable asset**, contributing $70 trillion dollars in production annually and an additional $30 trillion in ecosystem services that benefit humanity.
- In the U.S. $1.5 trillion in cargo moves through U.S. seaports and only 14% of coastal counties produce more that 45% of U.S. GDP.
- More than **3 million U.S. jobs are dependent on oceans** and Great Lakes resources and 3.2 billion people live and work within 60 miles of the sea.
- NOAA ***reported employment growth in the ocean economy by 2.7% relative*** to the 1.7% rate found nationally in six job sectors dependent on natural ocean resources. These include: 1) living resources, 2) marine transportation, 3) marine engineering and construction, 4) mineral extraction, 5) ship and boat building, and 6) recreation and tourism.
- The oceans and Great Lakes are critical to Pennsylvania's economy. PA has 3 major ports that provide $50 billion dollars to the Commonwealth's economy.
- ***Our students should have every opportunity to not only take part in this workforce, but to graduate prepared to lead the way*** in delivering and managing more sustainable, multi-disciplinary solutions to the challenges we face from climate change, biologic and natural resources, natural hazards, and other contemporary issues.

Who should minor in Marine Science?

- The Marine Science Minor is designed to complement the liberal arts training of Shippensburg University students, especially those majoring in STEAM fields.
- The minor provides an ***opportunity for any Shippensburg student*** to obtain an interdisciplinary education in Marine Science that will complement their major.

What can you do with the minor?

- When combined with another major, the minor will provide students an excellent foundation for the workforce or graduate school.
- Graduates are uniquely positioned to work in geoenvironmental and biological sciences, coastal development, land use and resource management, environmental engineering, marine research, education, international relations, aquariums, aquaculture and fisheries, and more.
- Workforce projection data indicate that jobs will be available in a growing number of industries, governmental agencies, educational organizations, non-profits, and within both commercial industries and consulting arenas.

What about the curriculum?

- The interdisciplinary program focuses on ocean and coastal environments, their natural resources, biology, hazards, and contemporary geoenvironmental and conservation issues.
- The curriculum provides a foundation in ocean sciences focusing on content, technologies, and skills that enable students to investigate problems in marine science including natural systems evolution, ecology, resources, hazards, sustainability, resource management, and resiliency.

What will you learn?

- Upon completion of the Marine Science minor, students will be able to demonstrate:
    - content knowledge of foundational concepts and contemporary issues in marine sciences and how these impact humans and are impacted by human activities;
    - knowledge of the geography and physiography of marine, coastal, and marginal seas, and associated natural resources;
    - knowledge of the biological diversity of marine, coastal, and marginal seas, their ecology and ecosystem services, and how biodiversity responds to environmental change and human exploitation through time;
    - proficiency in the use of the scientific method and common laboratory, field techniques and equipment used to solve marine science related problems pertinent to resource and sustainable management of ocean assets.

Program Advising Checksheet

19 Credit Marine Science Minor

To declare the minor: students need to have 30 credits earned and a GPA of 2.0 or higher.

Minor students must:

- successfully complete at least 19 credits
- complete at least 6 credits in 300 or higher level coursework
- complete at least 6 credits at the Chincoteague Bay Field Station (or in other marine-coastal field-based courses by advisement)
- complete a capstone from the three options below

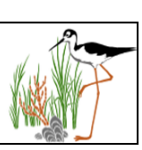
Note:

* indicates courses taught at Chincoteague Bay Field Station in summer programs!

Required Courses:	7 Credits	When?	Pre-requisites?
BIO 162 Principles of Biology	4 cr	Fall or Spring	NO
ESS 220 Oceanography	3 cr	Fall Only	ESS 110/210 or any Chemistry
Foundations of Marine Science Courses (select 2)	**6 Credits**		
ESS 212 – Historical Geology	3 cr	Spring Only	ESS 110/210
ESS 190 – Selected Topics	3 cr	Summer (primarily)	NO
ESS 340 – Marine Geology*	3 cr	Summer	ESS 110/210
BIO 190 – Selected Topics	3 cr	On occasion	By advisement
BIO 205 – Marine Biology*	3 cr	Summer	BIO 162
BIO 245 – Marine Ecology*	3 cr	Summer	BIO 162
Advanced Marine Geoscience / Marine Biology Courses (select 1)	**3 Credits**		
GEO 332 – Field Methods in Oceanography*	3 cr	BIO 401 – Coral Reef Ecology*	3 cr
GEO 336 – Coastal Geomorphology*	3 cr	BIO 402 – Marine Evolution & Ecology*	3 cr
GEO 360 – Internship (by advisement)	3 cr	BIO 413 – Marine Ichthyology*	3 cr
GEO 450 – Regional Geography / Geology Field Study	3 cr	BIO 417 – Coastal Herpetology*	3 cr
ESS 397- Intro to Research (by advis)	3 cr	BIO XXX – Marine Mammals*	3 cr
ESS 404 – Applied Meteorology & Climatology – or GEO 203 Climatology	3 cr	BIO XXX – Marine Botany*	3 cr
ESS 410 – Sedimentary Geology & Paleoenv.	3 cr	BIO XXX – Marine Ichthyology*	3 cr
ESS 490 – Special Topics (by advis.)	3 cr	BIO 442 – Aquatic Ecology	3 cr
BIO 315 – Marine Invertebrates*	3 cr	BIO 444 – Conservation Biol*	3 cr
BIO 393 – Special Topics (by advis)	3 cr	BIO 462 – Invertebrate Zoo.	3 cr
BIO 391 or 392 – Internship (by advis)	3 cr	BIO 463 – Vertebrate Zoo.	3 cr
BIO 397/8 – Intro. to Research (by advis)	3 cr		
Marine Science Capstone (select 1)	**3 Credits**		
Option A: Course-based capstone – ESS 451 or GEO 450 or BIO 401 or BIO 547 or by advis.			3 cr
Option B: Research-based capstone – ESS 397 OR ESS 475 OR BIO 397 OR BIO 398			3 cr
Option A: Internship-based capstone – GEO 360 OR BIO 391 OR BIO 392			3 cr

Special thanks to our partner:

Chincoteague Bay Field Station of the Marine Science Consortium



GEOGRAPHY-EARTH SCIENCE PROGRAM Name:_____

SUSTAINABILITY MINOR

Sustainability Minor (21 Cr)

Sustainability Core (6 credits)

Required:

GEO 427 Environmental Sustainability

Select 1:

ESS 108 Conservation of Natural Resources

BIO 145 Environmental Biology

Sustainable Systems (Select 1)

ESS 214 Geology of National Parks

ESS 404 Applied Meteorology and Climatology

ESS 413 Rock and Mineral Resources

ESS 442 Environmental Geology

ESS 451 Coastal Environmental Geography

GEO 405 Environ. Conserv. and Mgmt. in PA

GEO 444 Environmental Land Use Planning

GEO 446 Water Resources Management

GEO 450 Geography-Geology Field Study

Biology (Select 1)

BIO 205 Marine Biology (BIO 162)

BIO 210 Field Zoology (BIO 162)

BIO 208 Field Biology (BIO 162)

BIO 230 Botany (BIO 161, 162)

BIO 242 Ecology* (BIO 162)

BIO 245 Marine Ecology (BIO 162)

BIO 442 Aquatic Ecology (BIO162)

BIO 444 Conservation Biology (BIO 242)

Psychology and Sociology (Select 1)

PSY 350 The Psychology of Sustainability* (PSY 101)

SOC 265 Global Society (SOC 101)

SOC 346 City and Community (SOC 101)

SOC 354 Social Movements and Social Change (SOC 101)

SOC 363 Population Problems (SOC 101)

SOC 440 Leader in Global Society (SOC 101)

Economics and Business (Select 1)

ECO 345 The Economics of Growth & Development (ECO 102)

ECO 355 Environmental Economics* (ECO 102)

GEO 230 Economic Geography

MGT 447 Business and Society

MIS 142 Business Computer Systems

MIS 242 Design and Dev of User Info Systems (MIS 142)

SCM 420 Global Logistics Systems (SCM 330 rec.)

English, History, and Communication (Select 1)

ENG 238 Technical Writing

ENG 359 Native American Literature

HCS 345 Environmental Communication*

HIS 358 American Environmental History*

Note: Prerequisits are in parentheses.

* Strongly recommended classes.

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