UNDERGRADUATE CURRICULUM CHANGE MEMO

Date: 11-04-2020

From: Dr. Mark Engle, Dept. of Geological Sciences

Proposal Title: Revision of the Environmental Science Hydroscience Concentration Degree Plan and development of a 3000-level hydrologic science course with lab

Justification of Changes: Given a continued interest in water resources in the region, successful funding throughout the University on water-related projects, and two recent faculty hires who focus on hydrology and water resources within the Department of Geological Sciences, the Environmental Science Program is revise its degree plan and expand classroom opportunities through the creation of a new, 3000-level course entitled, "Principles of Hydrology" and its corresponding lab.

After a review of several B.S. hydrologic science degree plans around the country and evaluating student's needs and our rapidly expanding skills sets, we are requesting an update of the B.S. Environmental Science Hydroscience Concentration Degree Plan. This revised plan is significantly different than the previous version, allowing for more flexibility and opportunities to follow other pathways.

The new proposed course and corresponding lab were developed through faculty meetings involving several members of the Geological Sciences department. The current principal undergraduate offering in this topic area, General Hydrogeology, a 4000-level course. Largely due to the lack of courses covering basic concepts such as the hydrologic cycle, much of the General Hydrogeology course is spent introducing material, rather than focusing on material more traditionally covered in such a course. In addition, these proposed changes fix some problems related to prerequisites in the current degree plan.

We feel this update better reflects the needs of our students, their future employers, more hydrologic science coursework, and provides them with a more flexible experience.

Proposed changes:

1) **Creation of a new ESCI course and lab:** ESCI 3106-3306 – Principles of Hydrology and Lab, which replaces GEOL 2309-2109 – Mineralogy and Lab

2) **Update:** the prerequisites for GEOL 3312 – Geoscience Processes, GEOL 4383 – General Hydrogeology, and GEOP 4350 - Field Geophysics (proposed changes shown in course change form)

3) Make the following changes to the B.S. Environmental Science Hydroscience Concentration Degree Plan (Changes highlighted in green)
    a. **Add:** (GEOL 4335 – Soil Properties and Genesis OR GEOL 4373 – Groundwater Contamination and Reclamation) AND GEOP 3320A – Introduction to Geophysics AND ESCI 3306-3106 – Principles of Hydrology and Lab to required courses
    b. **Delete:** GEOL 2309-2109 – Mineralogy & Petrology and Lab from required courses
    c. **Move:** GEOL 3323-3123 – Structural Geology and Lab and GEOL 3326-3126 - Sedimentology & Stratigraphy and Lab from required courses to recommended courses
    d. **Change:** 9 upper division hours from any courses in CHEM, ESCI, GEOG, GEOL, GEOP to 11 upper division hours from any courses in CE, CHEM, ESCI, GEOG, GEOL, GEOP
    e. **Change:** Requirement for GEOL 4375 Field Camp I to GEOL 4375 Field Camp I or GEOP 4350 Field Geophysics
    f. **Change:** The course numbers for ESCI 2201, ESCI 2204, and ESCI 2105 to ESCI 3201, ESCI 3204, and ESCI 3105, correspondingly, as there is a concurrent proposal to change the numbers of these courses.

CURRICULUM CHANGE PROPOSAL

APPROVAL PAGE

Proposal Title: Revision of the ESCI Hydroscience Concentration Degree Plan

College: Science **Department: Geological Sciences**

DEPARTMENT CHAIR

I have read the enclosed proposal and approve this proposal on behalf of the department.

James Kubicki — 12/16/2020

Signature **Date**

COLLEGE CURRICULUM COMMITTEE CHAIR

I have read the enclosed documents and approve the proposal on behalf of the college curriculum committee.

Nancy Marcus — 1-14-2021

Signature **Date**

COLLEGE DEAN

I have read the enclosed documents and approve the proposal on behalf of the college. I certify that the necessary funds will be allocated by the college in support of this proposal.

Robert A. Kinchen — 1-14-21

Signature **Date**

College of Science

Bell Hall 100 747-5536

The University of Texas at El Paso

El Paso, Texas 79968-0509

Updated:

Bachelor of Science Degree Plan

Environmental Science - Hydroscience Concentration

Minimum Requirement (120/37)

Name Address Date

Major: Environmental Science - Hydroscience Concentration **Minor: None**

Departmental Chair: Dr. James Kubicki

Director of Academic Advising: Dr. Tina Garza

Director of Environmental Science Advising: Christine Sanchez

At Least C Grades in Math Courses & Core Curriculum

At Least C Grades in Lower Division Courses in the Major & Minor

At Least 2.0 GPA overall and in the major+A47

Pre-Requisites Located on Next Page

REQUIREMENTS ***

	Items Subjects	Has	Needs
A	**General Education**		
	(Minimum "C" grades required)		
1	**Communication:**		6
	COMM 1611, RWS 1601		
	RWS 1301, RWS 1302, ENGL 1313,		
	For students whose secondary education was		
	not in English, ESOL 1311, ESOL 1312		
2	**Mathematics**		
	MATH 1411		4
	MATH 1312		3
3	**Natural Science** **		
	See Items B and C		
4	**Language, Philosophy, & Culture**		
	ENGL 2311, 2312 2313, 2314, 2318,		3
	FREN 2322, RS 1301, SPAN 2340,		
	HIST 2301, 2302, PHIL 1301, 2306		
	RS 1301, SPAN 2340, WS 2300, WS 2350		
5	**Creative Arts**		
	ART 1300, ARTH 1305, ARTH 1306,		3
	DANC 1304, MUS 1324, MUSL 1327,		
	MUSL 2321, THEA 1313, FILM 1390		
6	**American History**		
	HIST 1301		3
	HIST 1302		3
7	**Government/Political Science**		
	POLS 2310		3
	POLS 2311		3
8	**Social and Behavioral Sciences**		
	ANTH 1301, 1302, 1310, 2320, CE 2326,		3
	COMM 2350, 2372, ECON 2303, 2304,		

	Items Subjects	Has	Needs
B	**Designated (ESCI) Core**		
	ESCI 1301-1101 Intro to Env. Sci. and Lab		4
	ESCI 1310 Field Methods		3
	ESCI ~~2105~~ 3105 Environmental Science Research 2		1
	ESCI ~~2201~~ 3201 Env. Policy & Law		2
	ESCI ~~2204~~ 3204 Environmental Science Research		2
	ESCI 3192 Professional Development		1
	ESCI 4301 Senior Project		3
	ESCI 4320 Monitoring Regional Sustainability		3
	ESCI 4398 Internship		3
C	**Environmental Hydroscience Concentration**		
	ESCI 3306-3106		4
	GEOL 1313, GEOL1314		6
	CHEM 1305-1105, CHEM 1306-1106		8
	PHYS 2420 or PHYS 2320-2120		4
	PHYS 2230		2
	~~GEOL 2309-2109,~~ GEOL 3312-3112		~~8~~ 4
	~~GEOL 3323-3123, 3326-3126~~		~~8~~
	GEOL 4335 or GEOL 4373		3
	GEOP 3320A		3
	MATH 2326		3
	GEOL 4375~~, GEOL 4383~~ or GEOP 4350		~~6~~ 3
	GEOL 4383		3
	STAT 2480		4
D	**Add ~~9~~ 11 Hours From**		~~9~~ 11
	Any courses in CE, CHEM, ESCI, GEOG, GEOL,		
	GEOP - GEOP 4385 strongly recommended		
	All other courses require departmental		
	approval		

	EDPC 1301, EDU 1342, ENGL 2320,		
	GEOG 1310, LING 2320, 2340, PSYC 1301,		
	SOCI 1301, SOCI 1310		
9	**Component Area Option**		
	BUSN 1301, COMM 1301, COMM 1302,		6
	CS 1310, CS 1320, SCI 1301, UNIV 1301		

	TOTAL HOURS	**0**	**120**

COMMENTS:

Dr. Nancy Marcus, Associate Dean, College of Science

This degree plan is just a sample. Your individualized degree plan may differ.

** **Although the UTEP choice is larger, this selection satisfies the requirements of both the core and the major.**

COURSES	PRE-REQUISITES	Credits
CHEM 1305-1105 - General Chemistry I	MATH 1508 or higher (Math 1508 may be taken concurrently)	4
CHEM 1306-1106 - General Chemistry II	CHEM 1305-1105	4
ESCI 1301-1101 - Introduction to Environmental Science and Lab	None	4
ESCI 1310 - Field Methods in Environment Science	ESCI 1301-1101	3
ESCI 3105 - Environment Science Research II	ESCI 3204	1
ESCI 3201 - Environmental Policy and Law	ESCI 1301-1101	2
ESCI 3204 - Environmental Science Research I	ESCI 1310	2
ESCI 3306-3106 - Principles of Hydrology and Lab	ESCI 1301 or GEOL 1313 or GEOL 1211	4
ESCI 3192 -- Professional Development	Restricted to majors	1
ESCI 4301 - Senior Project	Senior Standing, ESCI 3105, ESCI 3201	3
ESCI 4320 - Monitoring Regional Sustainability	Junior or Senior Standing	3
ESCI 4398 - Internship	ESCI 3201	3
GEOG 1310 - Cultural Geography	None	3
GEOL 1313 - Introduction to Physical Geology	None	3
GEOL 1314 - Introduction to Historical Geology	GEOL 1313	3
GEOL 3312-3112 - Geosciences Processes and Lab	GEOL 1313 or GEOL 1211 AND GEOL 1314 or GEOL 1212	4
GEOL 4335 - Soil properties and genesis	CHEM 1305 and GEOL 1313	3
GEOL 4373 - Groundwater Contamination and Reclamation	None	3
GEOL 4375 - Field Geology I	Restricted to majors	3
GEOL 4383 - General Hydrogeology	GEOL 2309 or GEOL3321 or ESCI 3306 and MATH 2326	3
GEOP 3320A - Introduction to Geophysics	GEOL 3312	3
GEOP 4350 - Field geophysics	GEOP 3320 A	3
MATH 1312 - Calculus II	MATH 1411	4
MATH 1411 - Calculus I	Placement or MATH 1508	4
MATH 1508 - Pre-Calculus	Placement or MATH 0311	5
MATH 2326 - Differential Equations	MATH 1312 or MATH 2326	3
PHYS 2230 - Thermal and Fluid Physics	PHYS 2420	2
PHYS 2420 - Introductory Mechanics	MATH 1411	4
STAT 2480 - Statistics and Probability	MATH 1320 or MATH 1508 or MATH 1411	4

THE UNIVERSITY OF TEXAS AT EL PASO

College of Science

1/14/21

BS ENVIRONMENTAL SCIENCE with HYDROSCIENCE CONCENTRATION

SAMPLE FOUR-YEAR PLAN - START WITH MATH 1411

FRESHMEN YEAR						Hours
Semester 1 Fall		**Semester 2 Spring**		**Summer Sessions**		
MATH 1411 - Calculus	4	MATH 1312 - Calculus II	3	HIST 1301 - History of US to 1865	3	
CHEM 1305-1105 - General Chemistry 1 & Lab	4	CHEM 1306-1106 - General Chemistry II & Lab	4	HIST 1302 - History of US Since 1865	3	
RWS 1301 - Rhetoric & Composition 1	3	RWS 1302 - Rhetoric & Composition 2	3			
ESCI 1301-1101 - Introduction to Environmental Science and Lab	4	COMM 1301 - Public Speaking	3			
TOTAL	15	TOTAL	13	TOTAL	6	34

SOPHOMORE YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 1310 - Field Methods in Environmental Science	3	COMM 1302 - Business and Professional Communication	3	POLS 2310 - Introduction to Politics	3	
GEOL 1313 - Introduction to Physical Geology	3	GEOL 1314 - Historical Geology	3	POLS 2311 - American Government & Politics	3	
PHYS 2420 - Introductory Mechanics & Lab	4	PHYS 2230 - Thermal and Fluid Physics	2			
PHIL 2306 - Ethics	3	MATH 2326 - Differential Equations	3			
		ENGL 3359 - Technical Writing	3			
TOTAL	13	TOTAL	14	TOTAL	6	33

JUNIOR YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 3204 - Environmental Science Research I	2	ESCI 3105 - Environmental Science Research 2	1	GEOP 4350 - Field Geophysics	3	
ESCI 3306-3106 - Principles of Hydrology and Lab	4	PSYC 1301 - Introduction to Psychology	3			
ART 1300 - Art Appreciation	3	ESCI 3201 - Environmental Policy and Law	2			
GEOL 3312-3112 - Geoscience Processes and Lab	4	GEOP 3320A - Introduction to Geophysics	3			
ESCI 3192 - Professional Development in Environmental Science	1	STAT 2480 - Elementary Statistical Methods	4			
TOTAL	14	TOTAL	13	TOTAL	3	30

SENIOR YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 4398 - Environmental Science Internship	3	GEOL 4383 - General Hydrogeology	3			
Elective	3	GEOL 4335 - Soil Properties & Genesis	3			
Elective	3	ESCI 4301 - Senior Project	3			
Elective	2	Elective	3			
TOTAL	11	TOTAL	12	TOTAL	0	23

Note: If you have any questions about this sample four-year plan or any degree offered by the College of Science, all the College of Science Advisors at 747-8027.

Total Semester Hours 120

THE UNIVERSITY OF TEXAS AT EL PASO

College of Science

1/14/21

BS ENVIRONMENTAL SCIENCE with HYDROSCIENCE CONCENTRATION

SAMPLE FOUR-YEAR PLAN - START WITH MATH 1508

FRESHMEN YEAR						
Semester 1 Fall		**Semester 2 Spring**		**Summer Sessions**		Hours
MATH 1508 - Precalculus	5	MATH 1411 - Calculus	4	HIST 1301 - History of US to 1865	3	
CHEM 1305-1105 - General Chemistry 1 & Lab	4	CHEM 1306-1106 - General Chemistry II & Lab	4	HIST 1302 - History of US Since 1865	3	
RWS 1301 - Rhetoric & Composition 1	3	RWS 1302 - Rhetoric & Composition 2	3			
ESCI 1301-1101 - Introduction to Environmental Science and Lab	4	COMM 1301 - Public Speaking	3			
TOTAL	16	TOTAL	14	TOTAL	6	36

SOPHOMORE YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 1310 - Field Methods in Environmental Science	3	COMM 1302 - Business and Professional Communication	3	POLS 2310 - Introduction to Politics	3	
GEOL 1313 - Introduction to Physical Geology	3	GEOL 1314 - Historical Geology	3	POLS 2311 - American Government & Politics	3	
PHYS 2420 - Introductory Mechanics & Lab	4	PHYS 2230 - Thermal and Fluid Physics	2			
MATH 1312 - Calculus II	3	MATH 2326 - Differential Equations	3			
PHIL 2306 - Ethics	3	ENGL 3359 - Technical Writing	3			
TOTAL	16	TOTAL	14	TOTAL	6	36

JUNIOR YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 3204 - Environmental Science Research I	2	ESCI 3105 - Environmental Science Research 2	1	GEOP 4350 - Field Geophysics	3	
ESCI 3306-3106 - Principles of Hydrology and Lab	4	PSYC 1301 - Introduction to Psychology	3			
ART 1300 - Art Appreciation	3	ESCI 3201 - Environmental Policy and Law	2			
GEOL 3312-3112 - Geoscience Processes and Lab	4	GEOP 3320A - Introduction to Geophysics	3			
ESCI 3192 - Professional Development in Environmental Science	1	STAT 2480 - Elementary Statistical Methods	4			
TOTAL	14	TOTAL	13	TOTAL	3	30

SENIOR YEAR						
Semester 1		**Semester 2**		**Summer Sessions**		
ESCI 4398 - Environmental Science Internship	3	GEOL 4383 - General Hydrogeology	3			
Elective	3	GEOL 4335 - Soil Properties & Genesis	3			
Elective	3	ESCI 4301 - Senior Project	3			
Elective	2	Elective	3			
TOTAL	11	TOTAL	12	TOTAL	0	23

Note: If you have any questions about this sample four-year plan or any degree offered by the College of Science, all the College of Science Advisors at 747-8027.

Total Semester Hours 125

Degree Plan

BS in Environmental Science Core for all concentrations

Required Credits: 120

Code	Title	Hours
Designated Core (All courses require a grade of C or better)		
Required Courses:		
CHEM 1105	Laboratory for CHEM 1305	1
CHEM 1106	Laboratory for CHEM 1306	1
CHEM 1305	General Chemistry	3
CHEM 1306	General Chemistry	3
ESCI 1101	Environmental Sci. Lab	1
ESCI 1301	Intro to Environmental Sci	3
ESCI 1310	Field Methods in Env Science	3
ESCI 3105	Research Exp in Env Science 2	1
ESCI 3201	Environmental Policy & Law	2
ESCI 3204	Research Exp in Envi Science 1	2
ESCI 3192	Prof. Development in ESCI	1
ESCI 4301	Senior Project	3
ESCI 4320	Monitoring Regional Sust	3
ESCI 4398	Environmental Sci. Internship (Note: Not required for ESCI Secondary Education Minor)	3
MATH 1411	Calculus I	4
STAT 2480	Elementary Statistical Methods	4
University Core Curriculum		

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Code	Title	Hours
Complete the University Core Curriculum requirements.		42
Concentration		
Select one of the concentrations below:		40
Upper Division Requirement		
Select a total of thirty-seven hours of upper division course work		
Total Hours		**120**

Environmental Hydroscience concentration

Code	Title	Hours
Environmental Hydroscience Concentration		
Required Courses:		
GEOL 1313	Intro to Physical Geology	3
GEOL 1314	Intro to Historical Geol	3
MATH 1312	Calculus II	3
MATH 2326	Differential Equations	3
PHYS 2230	Thermal and Fluid Physics	2
PHYS 2420	Introductory Mechanics	4
PHYS 2421	Introductory Electromagnetism	4
ESCI 3306 & ESCI 3106	Principles of Hydrology and Principles of Hydrology Lab	4
GEOL 3312 & GEOL 3112	Geoscience Processes and Geoscience Processes Lab	4
GEOP 3320A	Introduction to Geophysics	3
GEOL 4335 or GEOL 4373	Soil properties and genesis or Groundwater Contamination and Reclamation	3
GEOP 4350 or	Field geophysics or	3

Deleted: Mineralogy & Petrology and Mineralogy & Petrology Lab

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Deleted: GEOL 2309 & GEOL 2109

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Deleted: Structural Geology and Structural Geology Lab

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Code	Title	Hours
GEOL 4375	Field Geology I	
GEOL 4383	General Hydrogeology	3
Ethics or Policy:		
Select eleven upper division hours from any courses in CE, CHEM, ESCI, GEOG, GEOL, GEOP		11
GEOL 4385 is strongly recommended		
Total Hours		**53**

You cannot choose this concentration until you meet three criteria: your UTEP overall GPA must be at least 2.75, your UTEP majors GPA must be at least 2.75, and you must pass the UTEP Qualifying Exam in Science with a score of at least 80%.

Deleted: GEOL 3326 & GEOL 3126

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COURSE ADD

All fields below are required

College : Science **Department :** Environmental Science

Rationale for adding the course:
Given a continued interest in water resources in the region, successful funding throughout the University on water-related projects, and new faculty hires focusing on hydrology and water resources within the Department of Geological Sciences, the Environmental Science Program is revise its degree plan and expand classroom opportunities through the creation of a new, 3000-level course entitled, "Principles of Hydrology" and its corresponding lab.

All fields below are required

Subject Prefix and # ESCI 3306

Title (29 characters or fewer): Principles of Hydrology

Dept. Administrative Code : 1280

CIP Code 03.0104.00

Departmental Approval Required ☐Yes ☒No

Course Level ☒UG ☐GR ☐DR ☐SP

Course will be taught: ☒ Face-to-Face ☐ Online ☐ Hybrid

How many times may the course be taken for credit? (Please indicate 1-9 times): 1

Should the course be exempt from the "Three Repeat Rule?" ☐Yes ☒No

Grading Mode: ☒Standard ☐Pass/Fail ☐Audit

Description (600 characters maximum):
Fundamental principles of hydrologic sciences and water as a natural resource. Topics covered include aspects of the hydrologic cycle, streams and flooding, groundwater and aquifers, water quality, and water distribution and use. Materials from local and current interests are incorporated.

Contact Hours (per week): 3 Lecture Hours Lab Hours Other

Types of Instruction (Schedule Type): Select all that apply

☒A	Lecture	☐ H	Thesis
☐ B	Laboratory	☐ I	Dissertation
☐ C	Practicum	☐ K	Lecture/Lab Combined
☐ D	Seminar	☐ O	Discussion or Review (Study Skills)
☐ E	Independent Study	☐ P	Specialized Instruction
☐ F	Private Lesson	☐ Q	Student Teaching

Fields below if applicable

If course is taught during a part of term in addition to a full 16-week term please indicate the length of the course (ex., 8 weeks):

TCCN (Use for lower division courses) :

Prerequisite(s):		
Course Number/ Placement Test	**Minimum Grade Required/ Test Scores**	**Concurrent Enrollment Permitted? (Y/N)**
ESCI 1301 or GEOL 1211 or GEOL 1313	**C**	**N**

Corequisite Course(s):
ESCI 3106

Equivalent Course(s):

Restrictions:	
Classification	

Major	

The University of Texas at El Paso
College of Science
Department of Geological Sciences
Proposed Syllabus

Course Prefix and Number: ESCI 3306
Course Title: Principles of Hydrology
Credit Hours: 3

Prerequisite Courses: ESCI 1301 or GEOL 1313 or GEOL 1211

Corequisite Course: ESCI 3106

Course Description: Fundamental principles of hydrologic sciences and water as a natural resource. Topics covered include aspects of the hydrologic cycle, streams and flooding, groundwater and aquifers, water quality, and water distribution and use. Materials from local and current interests are incorporated.

Learning Outcomes: (Describe the measurable learning outcomes for the course.)
Students who have successfully completed this course will be able to:

1) Define and describe key hydrologic processes operating in air vs. humid and coastal vs. inland environments.
2) Identify natural controls on stream flow
3) Describe how human activities affect flooding and runoff
4) Define water table, saturated zone, and unsaturated zone
5) Identify major water quality issues
6) Provide an account of water resources, withdrawals, consumption, and uses locally and nationally
7) Describe major U.S. legal and regulatory statues affecting water

Required Materials: Introduction to Water Resources by John C. Clausen, Waveland Press, Inc.

You will be expected to have read to required reading for the week before attending class, as the lectures are primarily meant to quickly summarize key points and cover other material in detail.

Course Policies: (Grading, attendance, academic integrity, etc.)

Course Grading:

Exams	30%	(Average of 4 Exams)
Homework Assignments	30%	(Class Assignment)
In-Class Participation	40%	(Must attend class)

Attendance: Attendance, which is key to success in this class, is mandatory and reflected in the course grading. If you have a legitimate reason for missing class (e.g., medical

appointment or illness, military service, or official University activities), please notify the instructor prior to the absence (as possible) and provide documentation. In the case of poor class attendance, students may be dropped from the class.

Academic Integrity: Academic dishonesty will be not tolerated in this class (please refer to the student conduct code handbook for details regarding university policy and definitions). Dishonesty includes, but is not limited to, plagiarism on term papers, unauthorized notes brought into an exam; copying answers from another student or letting another student copy your answers. The penalty for the first offense will be a grade of zero points on the exam or assignment. Penalty for the second offense will be an F for the course.

Course Statements: (Civility, disability, military, etc.)

Students with Disabilities: If you have a disability or if you are experiencing learning difficulties, please contact the Center for Accommodations and Support Services (CASS). You may contact them Monday through Friday 8:00a.m.-5:00p.m. Phone:(915) 747-5148. Union Building East Room 106 cass@utep.edu. They provide any necessary accommodations. You should also meet with me in order to facilitate your needs. You are expected to provide documentation of your disability in order to make special arrangements in this class.

Course Schedule: (List of topics to be covered by specified timeline. Indicate special target deadlines, such as examination days, last day to withdraw without penalty, and date and time of final exams.)

Week 1	Topic Covered	Required Reading	Homework
1	Introduction/Syllabus		
2	Scientific Units and Unit Conversions	Chapter 2	Unit Conversions
3	Distribution of the Earth's Water	Chapter 3	Sankey diagrams
4	Introduction to the Hydrologic Cycle - Exam 1	Chapter 3	None
5	Water Fluxes, Storage, and Balances	Chapter 3	Water Mass Balance
6	Precipitation and Interception	Chapters 4 and 5	Frequency Analysis
7	Evapotranspiration	Chapter 6	Energy Balance
8	Infiltration and saturation - Exam 2	Chapter 7	Infiltrometery
9	Stream flow and flooding	Chapter 9	Flood hydrographs
10	River Systems and watershed management	Chapter 10	
11	Soil water and the vadose zone	Chapter 7	Matric and water potential

12	Groundwater and aquifers – Exam 3	Chapter 8	None
13	Groundwater flow and wells	Chapter 9	Flow nets
14	Introduction to Water Quality	Chapter 11	Source apportionment
15	Introduction to water law	Chapter 19	None
16	None –Exam 4		

COURSE ADD

All fields below are required

College : Science **Department :** Environmental Science

Rationale for adding the course:
Given a continued interest in water resources in the region, successful funding throughout the University on water-related projects, and new faculty hires focusing on hydrology and water resources within the Department of Geological Sciences, the Environmental Science Program is revise its degree plan and expand classroom opportunities through the creation of a new, 3000-level course entitled, "Principles of Hydrology" and its corresponding lab.

All fields below are required

Subject Prefix and # ESCI 3106

Title (29 characters or fewer): Principles of Hydrology Lab

Dept. Administrative Code : 1280

CIP Code 03.0104.00

Departmental Approval Required ☐Yes ☒No

Course Level ☒UG ☐GR ☐DR ☐SP

Course will be taught: ☒ Face-to-Face ☐ Online ☐ Hybrid

How many times may the course be taken for credit? (Please indicate 1-9 times): 1

Should the course be exempt from the "Three Repeat Rule?" ☐Yes ☒No

Grading Mode: ☒Standard ☐Pass/Fail ☐Audit

Description (600 characters maximum):
This laboratory-based course takes information from ESCI 3306 and allows for implementation and exploration of hydrologic concepts. Topics covered include aspects of the hydrologic cycle, streams and flooding, groundwater and aquifers, water quality, and water distribution and use. Materials from local and current interests are incorporated.

Contact Hours (per week): Lecture Hours 1 Lab Hours Other

Types of Instruction (Schedule Type): Select all that apply

☐ A	Lecture	☐ H	Thesis
☒ B	Laboratory	☐ I	Dissertation
☐ C	Practicum	☐ K	Lecture/Lab Combined
☐ D	Seminar	☐ O	Discussion or Review (Study Skills)
☐ E	Independent Study	☐ P	Specialized Instruction
☐ F	Private Lesson	☐ Q	Student Teaching

Fields below if applicable

If course is taught during a part of term in addition to a full 16-week term please indicate the length of the course (ex., 8 weeks):

TCCN (Use for lower division courses) :

Prerequisite(s):		
Course Number/ Placement Test	**Minimum Grade Required/ Test Scores**	**Concurrent Enrollment Permitted? (Y/N)**
ESCI 1301 or GEOL 1313 or GEOL 1211	C	N

Corequisite Course(s):
ESCI 3306

Equivalent Course(s):

Restrictions:	
Classification	

Major	

The University of Texas at El Paso
College of Science
Department of Geological Sciences
Proposed Syllabus

Course Prefix and Number: ESCI 3106
Course Title: Principles of Hydrology Lab
Credit Hours: 1

Prerequisite Courses: ESCI 1301 or GEOL 1313 or GEOL 1211

Corequisite Course: ESCI 3306

Course Description: This laboratory-based course takes information from ESCI 3306 and allows for implementation and exploration of basic hydrologic concepts. Topics covered include aspects of the hydrologic cycle, streams and flooding, groundwater and aquifers, water quality, and water distribution and use. Materials from local and current interests are incorporated.

Learning Outcomes: (Describe the measurable learning outcomes for the course.)
Students who have successfully completed this course will be able to:

1) Define and describe key hydrologic processes operating in air vs. humid and coastal vs. inland environments.
2) Identify natural controls on stream flow
3) Describe how human activities affect flooding and runoff
4) Define water table, saturated zone, and unsaturated zone
5) Identify major water quality issues
6) Provide an account of water resources, withdrawals, consumption, and uses locally and nationally
7) Describe major U.S. legal and regulatory statues affecting water

Required Materials: None

Course Policies: (Grading, attendance, academic integrity, etc.)

Course Grading:

Homework Assignments	60%	(Class Assignment)
In-Class Participation	40%	(Must attend class)

Attendance: Attendance, which is key to success in this class, is mandatory and reflected in the course grading. If you have a legitimate reason for missing class (e.g., medical appointment or illness, military service, or official University activities), please notify the instructor prior to the absence (as possible) and provide documentation. In the case of poor class attendance, students may be dropped from the class.

Academic Integrity: Academic dishonesty will be not tolerated in this class (please refer

to the student conduct code handbook for details regarding university policy and definitions). Dishonesty includes, but is not limited to, plagiarism on term papers, unauthorized notes brought into an exam; copying answers from another student or letting another student copy your answers. The penalty for the first offense will be a grade of zero points on the exam or assignment. Penalty for the second offense will be an F for the course.

Course Statements:

Students with Disabilities:_If you have a disability or if you are experiencing learning difficulties, please contact the Center for Accommodations and Support Services (CASS). You may contact them Monday through Friday 8:00a.m.-5:00p.m. Phone:(915) 747-5148. Union Building East Room 106 cass@utep.edu. They provide any necessary accommodations. You should also meet with me in order to facilitate your needs. You are expected to provide documentation of your disability in order to make special arrangements in this class.

Course Schedule: (List of topics to be covered by specified timeline. Indicate special target deadlines, such as examination days, last day to withdraw without penalty, and date and time of final exams.)

Week 1	Topic Covered	Lab assignment
1	Introduction/Syllabus	
2	Introduction to hydrologic units and unit conversions	Volumes, velocities, and values
3	Distribution of the Earth's Water	Where's the World's Water?
4	Introduction to the Hydrologic Cycle	Concept sketch: Hydrologic Cycle
5	Water Fluxes, Storage, and Balances	Spreadsheet Modeling of the Hydrologic Cycle
6	Precipitation and Interception	Excess Rainfall
7	Evapotranspiration	Estimating ET from a Water Balance
8	Infiltration and saturation	Performing a double ring infiltrometer test
9	Stream flow and flooding	Flood Frequency and Risk Analysis
10	Watershed management	Watershed Analysis
11	Soil water and the vadose zone	Water retention curves
12	Groundwater and aquifers	Ant Farm and Water Table Groundwater Models
13	Groundwater flow and wells	Potentiometric surface models
14	Introduction to Water Quality	EPA's Water Quality Impairments in the Rio Grande
15	Introduction to water law	Western Water Law

16	Summary: Critical Zone Observatory Research	Water movement through the critical zone

COURSE CHANGE FORM

All fields below are required

College : Science **Department :** Geological Sciences

Rationale for changing the course:
To ensure that pre-requisitie requirements are coherent with the proposed change in the ESCI Hydroscience Degree Plan. Current ESCi Hydroscience students do not meet the current requirements for this course.

All fields below are required

Subject Prefix and number GEOL 3312

Course Title Geoscience Processes

Change	From	To
Ex. Prerequisite	**Ex. POLS 2310**	**Ex. POLS 2312**
Prerequities	(GEOL 1103 w/C or better AND GEOL 1313 w/C or better) OR (GEOL 1111 w/C or better) OR (GEOL 1211 w/C or better) AND (GEOL 1104 w/C or better AND GEOL 1314 w/C or better) OR (GEOL 1112 w/C or better AND GEOL 1212 w/C or better)	(GEOL 1313 w/C or better OR GEOL 1211 w/C or better) AND (GEOL 1314 w/C or better OR GEOL 1212 w/C or better)

These changes will be reflected in Banner, Goldmine, and the catalog

COURSE CHANGE FORM

All fields below are required

College : Science **Department :** Geological Sciences

Rationale for changing the course:
To ensure that pre-requisitie requirements are coherent with the proposed change in the ESCI Hydroscience Degree Plan and that the new ESCI 3306 course (Principles of Hydrology) is approved as a prerequisite for this course.

All fields below are required

Subject Prefix and number GEOL 4383

Course Title General Hydrogeology

Change	From	To
Ex. Prerequisite	**Ex. POLS 2310**	**Ex. POLS 2312**
Prerequities	(GEOL 3321 w/D or better) OR (GEOL 2109 w/D or better AND GEOL 2309 w/D or better) AND (MATH 1411 w/D or better AND MATH 2326 w/D or better)	(GEOL 3321 w/C or better) OR (GEOL 2109 w/C or better AND GEOL 2309 w/C or better) OR (ESCI 3306 w/C of better) AND (MATH 2326 w/C or better)

These changes will be reflected in Banner, Goldmine, and the catalog

COURSE CHANGE FORM

All fields below are required

College : Science **Department :** Geological Sciences

Rationale for changing the course:
To ensure that pre-requisitie requirements are coherent with the proposed change in the ESCI Hydroscience Degree Plan and the better reflect requirements for this course.

All fields below are required

Subject Prefix and number GEOP 4350

Course Title Field Geophysics

Change	From	To
Ex. Prerequisite	**Ex. POLS 2310**	**Ex. POLS 2312**
Prerequities	(GEOP 4420A w/C or better) AND (GEOP 4420B w/C or better)	GEOP 3320A w/C or better

These changes will be reflected in Banner, Goldmine, and the catalog