

Cover Sheet: Request 14107

ENV 4XXX Environmental Hydrology

Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Elliot Douglas elliot.douglas@essie.ufl.edu
Created	8/5/2019 3:56:47 PM
Updated	9/23/2019 10:09:55 AM
Description of request	Creation of a new course as part of a major curriculum change, approval request number 14095.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Environmental Engineering Sciences 011910000	Chang-Yu Wu		8/5/2019
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by HWCOE Curriculum Committee and Faculty Council	9/23/2019
Env Hydrology syllabus.docx					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			9/23/2019
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 14107

Info

Request: ENV 4XXX Environmental Hydrology

Description of request: Creation of a new course as part of a major curriculum change, approval request number 14095.

Submitter: Elliot Douglas elliott.douglas@essie.ufl.edu

Created: 8/5/2019 3:47:19 PM

Form version: 1

Responses

Recommended Prefix ENV

Course Level 4

Number XXX

Category of Instruction Advanced

Lab Code None

Course Title Environmental Hydrology

Transcript Title Env Hydrol

Degree Type Baccalaureate

Delivery Method(s) On-Campus

Co-Listing No

Effective Term Earliest Available

Effective Year Earliest Available

Rotating Topic? No

Repeatable Credit? No

Amount of Credit 4

S/U Only? No

Contact Type Regularly Scheduled

Weekly Contact Hours 4

Course Description Atmospheric, surface, subsurface hydrology and interactions as part of the water cycle. Properties of natural and anthropogenic surfaces and porous media governing flow and transport.

Prerequisites (ENV 3040C or CGN 3421) & (STA 3032 or STA 2023) & (CWR 3201 or EGN 3353C)

Co-requisites None

Rationale and Placement in Curriculum This course provides students an understanding of water flow as applied to environmental engineering. It forms the basis for design and analysis of water systems in engineering practice. This course replaces two separate courses in hydrology by combining topics and eliminating redundancies between the two.

Course Objectives 1. Student will have an understanding of hydrologic processes and phenomena, from physical and mechanistic perspectives, in particular as they processes and phenomena relate to the transport of water over natural and anthropogenic (urban) surfaces of the earth. Through quantifying main components of the hydrologic cycle, students will develop an understanding of relationships between atmospheric, surface and subsurface (to lesser degree) waters.

2. Student will have an understanding of development and use of Reynolds Transport Theorem, Control Volumes, Continuity and Momentum Eqns. to hydrologic phenomena and processes.

3. The student will have an understanding of basic hydrograph theory, including the unit hydrograph, synthetic unit hydrographs and empirical hydrograph development. The student will develop an understanding of both theoretical and empirical rainfall runoff relationships.

4. The student will have an understanding of hydrologic design concepts, and the concepts of design curves and intensity-duration-frequency relationships. Engineering applications will also focus on engineering measurements and engineering applications of hydrologic design.

5. The student will have an understanding that the hydrologic cycle and our intended (or unintended) interactions at various scales of the hydrologic cycle in Florida, fundamentally impacts both environmental and civil engineering design and functionality.

Course Textbook(s) and/or Other Assigned Reading Applied Hydrology by Chow, Maidment and May, 1988 (ISBN 0-07-010810-2)2)

Weekly Schedule of Topics Week 1: Hydrologic cycle, overview of processes/phenomena, Reynold's Transport Theorem

Week 2: Atmospheric water, climate change and hydrologic cycle phenomena,

Week 3: Evaporation, potential evaporation, evapotranspiration and models,

Week 4: Groundwater topics, Soil properties, variably saturated flow phenomena, infiltration,

Week 5: Flow through porous media, analytical solutions Test 1: last week of Sept.

Week 6: Radial flow to wells,

Week 7: Field methods in groundwater hydrology,

Week 8: Vadose-Zone Hydrology,

Test 2: 3rd week of Oct.

Week 9: Contaminant fate and transport in porous media,

Week 10: Contaminated site characterization and remediation,

Week 11: Abstractions/hydrologic loss methods, Unit Hydrograph theory,

Week 12: Unit Hydrograph methods,

Week 13: Lumped flow routing, Distributed flow routing,

Test 3: 3rd week of Nov.

Week 14: Transport equations, hydrologic design and design metrics, hydrologic cycle restoration,

Week 15: Design storms/flows, hydrologic statistics, case studies of urban water, Test 4: Last day of class

Grading Scheme Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (6)	100	10%
Tests (4)	800	80%
Attendance (per class)	100	10%
	1000	100%

Instructor(s) John Sansalone, PhD, PE

Attendance & Make-up Yes

Accommodations Yes

UF Grading Policies for assigning Grade Points Yes

Course Evaluation Policy Yes

Environmental Hydrology

ENV 4xxx Section xxxx

Class Periods: TBD

Location: TBD

Academic Term: Spring 2023

Instructor:

Name: Professor John Sansalone, PhD, PE

Email Address: jsansal@ufl.edu

Office Phone Number: +3528460176

Office Hours: TBD

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

- TBD

Course Description

Atmospheric, surface, subsurface hydrology and interactions as part of the water cycle. Properties of natural and anthropogenic surfaces and porous media governing flow and transport. (4 credit hours)

Course Pre-Requisites / Co-Requisites

1. ENV 3040C (or CGN 3421) and 2. STA 3032 (or STA 2023) and 3. CWR 3201 (or EGN 3353C).

Course Objectives

This course focuses on a physical and quantitative understanding of hydrologic processes and their engineering applications. Water, in its three phases is the most abundant substance on earth, a fundamental component of all life, and a major force that is constantly, sometimes inexorably and sometimes violently shaping the surface of the earth. Hydrology, in general, deals with the waters of the earth in all phases, their distribution, circulation, physical and chemical properties; interactions with the natural and anthropogenic environments and with all life. Hydrology is the study, at various scales, of the endless circulation of water between the earth and atmosphere. Objectives of this course include an introduction to both the physical phenomena processes of the hydrologic cycle and a quantitative description of these phenomena and processes. The Reynolds Transport Theorem, the Continuity and Momentum Equations will be applied to phenomena and processes. An overview of the atmospheric, subsurface and surface water will be provided. Issues of hydrologic measurements will be presented. Hydrologic analyses, including unit hydrograph theory, lumped flow routing, and distributed flow routing will be developed. Hydrologic statistics and frequency analysis will be introduced. Theoretical and empirical rainfall-runoff relationships will be presented and examined. Finally, engineering concepts of hydrologic design, design storms and hydrologic chemistry will be introduced, along with the linkage of hydrology and stormwater management. Professional experience and research examples will be provided and be an integral part of the class.

Student Outcome Objectives:

1. Student will have an understanding of hydrologic processes and phenomena, from physical and mechanistic perspectives, in particular as they processes and phenomena relate to the transport of water over natural and anthropogenic (urban) surfaces of the earth. Through quantifying main components of the hydrologic cycle, students will develop an understanding of relationships between atmospheric, surface and subsurface (to lesser degree) waters.
2. Student will have an understanding of development and use of Reynolds Transport Theorem, Control Volumes, Continuity and Momentum Eqns. to hydrologic phenomena and processes.
3. The student will have an understanding of basic hydrograph theory, including the unit hydrograph, synthetic unit hydrographs and empirical hydrograph development. The student will develop an understanding of both theoretical and empirical rainfall runoff relationships.

4. The student will have an understanding of hydrologic design concepts, and the concepts of design curves and intensity-duration-frequency relationships. Engineering applications will also focus on engineering measurements and engineering applications of hydrologic design.

5. The student will have an understanding that the hydrologic cycle and our intended (or unintended) interactions at various scales of the hydrologic cycle in Florida, fundamentally impacts both environmental and civil engineering design and functionality.

Assessment Methods/Student Outcomes :

1. Homework (HW) will be assigned to assist students to develop the skill, discipline and confidence to solve problems in a logical manner involving the course topics. For a class intended to develop fundamental understanding and organizational skills, this is an important assessment. HW solutions are not graded; grading based on format and meeting turn-in time.

2. Tests will be used to determine level of understanding of the definitions, concepts, engineering methods and calculations presented in text, handouts, lectures and practiced in the HW.

3. Input/interaction between students, instructor and TA during class/HW sessions is used to assess student's ability to synthesize course material. Come to class/HW sessions, even at 8:40 AM!

Materials and Supply Fees

No materials or supply fees other than the course textbook

Professional Component (ABET):

The course includes direct professional engineering experience with respect to course topics and professional ethical practices on the course topics by a professor who professionally practiced course materials.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	Medium
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Low
4. An ability to communicate effectively with a range of audiences	Low
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	Medium
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	Medium
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- Applied Hydrology by Chow, Maidment and May, 1988 (ISBN 0-07-010810-2)

(Course notes are also provided and bring in knowledge not directly covered in, or complementing textbook)

Recommended Materials

Hydrology and Floodplain Analysis, Bedient & Huber, Addison Wesley, 1988 (and new edition).
Elements of Urban Stormwater Design, Malcom, H.R., North Carolina State University, 1989.
Stormwater Management, Wanielista, M.P. and Yousef, Y.A., John Wiley and Sons, 1993.
Handbook of Hydrology, Maidment, D. R., Editor, Mc-Graw Hill, Inc., 1993.
Hydrologic Analysis and Design, McCuen, R.H., Prentice-Hall, Inc., 1989.
Urban Drainage - Experimental Catchments in Italy, Edited by Calomino, F., Maksimovic, C., Molino, B., Editoriale Bios, 1995.
Il Centro Studi Deflussi Urbani, Calomino, F., Paoletti, A., Veltri, P., Consorzio PROAQUA, 1997 (In Italian, although the equations and plots transcend a specific language).
Introduction to Hydrology, 3rd Edition, Viessman, W., Lewis, G. and Knapp, J., Harper and Row, 1989.
Engineering Hydrology - Principles and Practices, Ponce, V., Prentice-Hall, Inc. 1989.
Stormwater Infiltration, Ferguson, B.K., CRC Press, Inc., 1994.
Hydrology and Floodplain Analysis, Bedient, P. and Huber, W., Addison-Wesley Publishing, 1988.
Underground Disposal of Storm Water Runoff - Design Guidelines Manual, USDOT, FHWA-TS-80-218, February, 1980,
Design and Construction of Urban Stormwater Management Systems, WEF and ASCE, ASCE Manuals and Reports of Engineering Practice No. 77, WEF Manual of Practice FD-20, 1992.
Urban Stormwater Hydrology, Kibler, D.F. Editor, Water Resources Monograph 7, American Geophysical Union, 1982.
Urban Stormwater Management, Special Report No. 49, American Public Works Assoc., 1981.
Stormwater Modeling, Overton, D.E., and Meadows, M.E., Academic Press, Inc., 1976.

Course Schedule

Week 1:	Hydrologic cycle, overview of processes/phenomena, Reynold's Transport Theorem	
Week 2:	Atmospheric water, climate change and hydrologic cycle phenomena,	
Week 3:	Evaporation, potential evaporation, evapotranspiration and models,	
Week 4:	Groundwater topics, Soil properties, variably saturated flow phenomena, infiltration,	
Week 5:	Flow through porous media, analytical solutions	<i>Test 1: last week of Sept.</i>
Week 6:	Radial flow to wells,	
Week 7:	Field methods in groundwater hydrology,	
Week 8:	Vadose-Zone Hydrology,	<i>Test 2: 3rd week of Oct.</i>
Week 9:	Contaminant fate and transport in porous media,	
Week 10:	Contaminated site characterization and remediation,	
Week 11:	Abstractions/hydrologic loss methods, Unit Hydrograph theory,	
Week 12:	Unit Hydrograph methods,	
Week 13:	Lumped flow routing, Distributed flow routing,	<i>Test 3: 3rd week of Nov.</i>
Week 14:	Transport equations, hydrologic design and design metrics, hydrologic cycle restoration,	
Week 15:	Design storms/flows, hydrologic statistics, case studies of urban water,	<i>Test 4: Last day of class</i>

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is required and will be verified by individual student signature. **Everyone has a bad test day on occasion; therefore you can drop your lowest test grade.** In fairness to the entire class, tests cannot be missed/re-scheduled with no exception except for actual emergency or scheduled conflict (i.e. you play on a UFL sports team and will be out of town). Notification of conflicts must be given in writing at least two weekdays (48 hours) before test, or in case of a documented emergency, after the test by a disinterested party such as a supervisor, doctor, coach, professor, law enforcement ..., not a friend/acquaintance. You are expected to work individually on a test - no group efforts. Failure to do so will result in a 0% for the test in question. On-line students have individual proctored tests (Proctor U) to be coordinated by the student. HW is to be turned in on paper before the start of the class in which the HW is due. HW turned in after the start of class will be marked with a 25% reduction in grade, 50% by the end of the class day, and 100% if late by 24 hours or more. Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation. Cheating and plagiarism in any form is not to be tolerated in this class. There shall be no phones out, present or available during a test and or exam. Copying, photographing or memorizing a test for the use of others is cheating.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (6)	100	10%
Tests (4)	800	80%
Attendance (per class)	100	10%
		100%

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://care.dso.ufl.edu>.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.