

# Cover Sheet: Request 14101

## ENV 4XXX Core 3: Processes in Environmental Engineering

### Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Elliot Douglas <a href="mailto:elliott.douglas@essie.ufl.edu">elliott.douglas@essie.ufl.edu</a>
Created	8/5/2019 2:04:26 PM
Updated	10/7/2019 3:16:06 PM
Description of request	This is a request for a new course as part of a major curriculum change, 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
No document changes					
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 14101

## Info

**Request:** ENV 4XXX Core 3: Processes in Environmental Engineering

**Description of request:** This is a request for a new course as part of a major curriculum change, request number 14095.

**Submitter:** Elliot Douglas [elliot.douglas@essie.ufl.edu](mailto:elliot.douglas@essie.ufl.edu)

**Created:** 10/7/2019 10:00:56 AM

**Form version:** 3

## Responses

**Recommended Prefix** ENV

**Course Level** 4

**Number** XXX

**Category of Instruction** Advanced

**Lab Code** None

**Course Title** Core 3: Processes in Environmental Engineering

**Transcript Title** Core 3: Proc Env Eng

**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** Theoretical and applied knowledge in environmental engineering processes across the air, water, and solid phases. Quantitative tools for describing materials and energy flows and transformations. Throughout the course, students will build knowledge base and relevant skills in topics that bridge disciplines, including statistics, thermodynamics, microbiology, and organic chemistry.

**Prerequisites** ENV3XXX, Core 2: Fundamentals of Environmental Engineering

**Co-requisites** None

**Rationale and Placement in Curriculum** This is the third course in a new five semester sequence as part of a major curriculum change. It integrates topic from environmental engineering that were previously taught in different classes.

**Course Objectives** At the end of this course students will be able to:

1. Calculate mass and energy flows in environmental systems.
2. Predict biological, chemical, and physical transformations in environmental systems.
3. Describe industrial processes for treatment of air, water, and solids.

**Course Textbook(s) and/or Other Assigned Reading** AIR: Air Pollution Control: A Design Approach. C. David Cooper and F. C. Alley, 4th Edition, 2011, ISBN 1-57766-678-X.

WATER: Water and Wastewater Treatment. Joanne E. Drinan, Frank L. Davis, Taylor and Francis, 2nd ed., 2012, 978-1-4398-5400-6

ECO: Readings from the literature and management agencies will be provided as PDFs.

SMM: Notes will be provided as PDFs; Compendium of Regulatory Thresholds (Target Copy); US EPA Waste Reduction Model. <https://www.epa.gov/warm>

**Weekly Schedule of Topics** Week      Topic

- 1      Drinking water treatment: mixed reactor, dispersed flow, and tanks-in-series

- 2 Coagulation and flocculation; rapid mix and flocculation design
- 3 Sedimentation and filtration; sedimentation design
- 4 Disinfection processes (chlorination of organic molecules, ozone, and UV-light)
- 5 Thermodynamics
- 6 Thermodynamics
- 7 Incineration and NO<sub>x</sub> emission control
- 8 Settling chamber and Cyclone
- 9 Municipal solid waste; construction and demolition debris
- 10 Organic waste management; industrial waste
- 11 Waste collection and transportation
- 12 Fundamentals of Life Cycle Assessment
- 13 Energy cycle, trophic levels, and food webs; pollutants in the environment
- 14 Ecological succession
- 15 Biological interactions

#### **Grading Scheme** Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (8)	10 each	20%
Midterm Exam (3)	100 each	60%
Final Project	100	20%
	100%	

**Instructor(s)** Andreia F. Faria

David Kaplan

Timothy G Townsend

Chang-Yu Wu

**Attendance & Make-up** Yes

**Accommodations** Yes

**UF Grading Policies for assigning Grade Points** Yes

**Course Evaluation Policy** Yes

## **Core 3: Processes in Environmental Engineering**

ENV 4XXX Section XXXX

**Class Periods:** TBD

**Location:** TBD

**Academic Term:** Spring 2023

### **Instructors:**

Andreia F. Faria

[andreia.faria@essie.ufl.edu](mailto:andreia.faria@essie.ufl.edu)

352-392-9537

Office Hours: TBD

David Kaplan

[dkaplan@ufl.edu](mailto:dkaplan@ufl.edu)

352-392-8439

Office Hours: TBD

Timothy G Townsend

[ttown@ufl.edu](mailto:ttown@ufl.edu)

352 392 0846

Office Hours: TBD

Chang-Yu Wu

[cywu@ufl.edu](mailto:cywu@ufl.edu)

352-392-0845

Office Hours: TBD

### **Teaching Assistants:**

Please contact through the Canvas website

● TBD

### **Course Description**

4 credits. Theoretical and applied knowledge in environmental engineering processes across the air, water, and solid phases. Quantitative tools for describing materials and energy flows and transformations. Throughout the course, students will build knowledge base and relevant skills in topics that bridge disciplines, including statistics, thermodynamics, microbiology, and organic chemistry.

### **Course Pre-Requisites / Co-Requisites**

ENV3XXX, Core 2: Fundamentals of Environmental Engineering

### **Course Objectives**

At the end of this course students will be able to:

1. Calculate mass and energy flows in environmental systems.
2. Predict biological, chemical, and physical transformations in environmental systems.
3. Describe industrial processes for treatment of air, water, and solids.

### **Materials and Supply Fees**

None

### **Professional Component (ABET):**

This course provides 4 credits of engineering topics and includes a design component.

**Relation to Program Outcomes (ABET):**

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	Medium
4. 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
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

**Required Textbooks and Software**

- AIR: Air Pollution Control: A Design Approach. C. David Cooper and F. C. Alley, 4th Edition, 2011, ISBN 1-57766-678-X.
- WATER: Water and Wastewater Treatment. Joanne E. Drinan, Frank L. Davis, Taylor and Francis, 2nd ed., 2012, 978-1-4398-5400-6
- ECO: Readings from the literature and management agencies will be provided as PDFs.
- SMM: Notes will be provided as PDFs; Compendium of Regulatory Thresholds (Target Copy); US EPA Waste Reduction Model. <https://www.epa.gov/warm>

**Course Schedule**

Week	Topic
1	Drinking water treatment: mixed reactor, dispersed flow, and tanks-in-series
2	Coagulation and flocculation; rapid mix and flocculation design; HW 1 due
3	Sedimentation and filtration; sedimentation design; HW 2 due
4	Disinfection processes (chlorination of organic molecules, ozone, and UV-light); Exam 1
5	Thermodynamics
6	Thermodynamics; HW 3 due
7	Incineration and NO <sub>x</sub> emission control; HW 4 due
8	Settling chamber and Cyclone; Exam 2
9	Municipal solid waste; construction and demolition debris
10	Organic waste management; industrial waste; HW 5 due
11	Waste collection and transportation; HW 6 due
12	Fundamentals of Life Cycle Assessment

<b>13</b>	Energy cycle, trophic levels, and food webs; pollutants in the environment; HW 7 due
<b>14</b>	Ecological succession; Project due
<b>15</b>	Biological interactions; HW 8 due
<b>Final Exam Week</b>	Exam 3

### ***Attendance Policy, Class Expectations, and Make-Up Policy***

Although attendance will not be taken, attendance in class is expected, as class time may include discussion or group work. Late and homework and makeup exams will only be allowed with prior approval of the instructor in the case of non-emergencies. For emergencies or illness prior approval is not needed, but appropriate documentation is required. 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.

### ***Evaluation of Grades***

<b>Assignment</b>	<b>Total Points</b>	<b>Percentage of Final Grade</b>
Homework Sets (8)	10 each	20%
Exams (3)	100 each	60%
Final Project	100	20%
		100%

Homeworks: Due on Fridays at 5 PM in the weeks shown in the course schedule above.

Exams: Held on Thursdays in the weeks shown in the course schedule above, except for the last exam which will be during the assigned final exam period.

Final Project: For your final project you will research an industrial process to describe the environmental engineering regulations that pertain to the process, and an environmental engineering mitigation strategy to ensure the process meets those regulations. The deliverable for this project is a 5 page paper (exclusive of references). Grades will be based on accurate description of the regulations, appropriate choice and accurate description of mitigation strategy, and writing quality. Papers are due Friday at 5 PM on the week shown in the course schedule above.

### ***Grading Policy***

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
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](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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](mailto:title-ix@ufl.edu), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto: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](mailto: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>.