

Cover Sheet: Request 14372

ENV3040C Computational Methods in Environmental Engineering

Info

Process	Course Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Barbi Jackson barbib@ufl.edu
Created	10/23/2019 3:01:40 PM
Updated	4/29/2020 3:20:27 PM
Description of request	Change/Update in official course description

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Environmental Engineering Sciences 011910000	Chang-Yu Wu		1/14/2020
2020Spring_ENV3040.docx					10/23/2019
College	Conditionally Approved	ENG - College of Engineering	Heidi Dublin	Conditionally Approved HWCOE Curriculum Committee on 1/31--add UF attendance policy and resubmit	1/31/2020
No document changes					
Department	Approved	ENG - Environmental Engineering Sciences 011910000	Michael Annable		4/29/2020
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin		4/29/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			4/29/2020
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|Modify for request 14372

Info

Request: ENV3040C Computational Methods in Environmental Engineering

Description of request: Change/Update in official course description

Submitter: Barbi Jackson barbib@ufl.edu

Created: 10/23/2019 2:58:08 PM

Form version: 1

Responses

Current Prefix

Enter the current three letter code (e.g., POS, ATR, ENC).

Response:

ENV

Course Level

Select the current one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.).

Response:

3

Number

Enter the current three digit code indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles.

Response:

040

Lab Code

Enter the current lab code. This code indicates whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:

C

Course Title

Enter the current title of the course as it appears in the Academic Catalog.

Response:

Computational Methods in Environmental Engineering

Effective Term

Select the requested term that the course change(s) will first be implemented. Selecting "Earliest" will allow the change to be effective in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's expectations. Courses cannot be changed retroactively, and therefore the actual

effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires at least 6 weeks after approval of the course change at UF.

Response:
Earliest Available

Effective Year

Select the requested year that the course change will first be implemented. See preceding item for further information.

Response:
Earliest Available

Requested Action

Indicate whether the change is for termination of the course or any other change. If the latter is selected, all of the following items must be completed for any requested change.

Response:
Other (selecting this option opens additional form fields below)

Change Course Prefix?

Response:
No

Change Course Level?

Note that a change in course level requires submission of a course syllabus.

Response:
No

Change Course Number?

Response:
No

Change Lab Code?

Note that a change in lab code requires submission of a course syllabus.

Response:
No

Change Course Title?

Response:
No

Change Transcript Title?

Response:
No

Change Credit Hours?

Note that a change in credit hours requires submission of a course syllabus.

Response:
No

Change Variable Credit?

Note that a change in variable credit status requires submission of a course syllabus.

Response:
No

Change S/U Only?

Response:
No

Change Contact Type?

Response:
No

Change Rotating Topic Designation?

Response:
No

Change Repeatable Credit?

Note that a change in repeatable credit status requires submission of a course syllabus.

Response:

No

Maximum Repeatable Credits

Enter the maximum credits a student may accrue by repeating this course.

Response:

0

Change Course Description?

Note that a change in course description requires submission of a course syllabus.

Response:

Yes

Current Course Description

Response:

Numerical modeling techniques and their application to environmental engineering. Use of personal computers and spreadsheets to solve numerical models. Solution techniques include numerical methods and their implementation using Excel and Visual Basic for Applications (VBA).

Proposed Course Description (50 words max)

Response:

Numerical modeling techniques and their application to environmental engineering. Use of personal computers and spreadsheets to solve numerical models. Solution techniques include numerical methods and their implementation using R.

Change Prerequisites?

Response:

No

Change Co-requisites?

Response:

No

Rationale

Please explain the rationale for the requested change.

Response:

Course description is more in line with how the course is currently being taught.

Computational Methods in Environmental Engineering

ENV 3040C, Section 3548

Class Periods: Tuesday/Thursday, Period 3, 9:35-10:25AM

Wednesday, Periods 8-10, 3:00-6:00PM

Location: T/T ROG rm 110; W CHE rm 237

Academic Term: Spring 2020

Instructor:

Dr. Kathe Todd-Brown

kathe.toddbrown@essie.ufl.edu

352-294-6604

Office Hours: Friday 1:00-4:00PM Phelps Lab, rm B006

Course Description

Numerical modeling techniques and their application to environmental engineering. Use of personal computers and spreadsheets to solve numerical models. Solution techniques include numerical methods and their implementation using R. 3 Credits

Course Pre-Requisites / Co-Requisites

Prerequisite: MAC 2313 Analytic Geometry and Calculus 3

Corequisite: MAP 2302 Elementary Differential Equations

Course Objectives

This course will introduce the fundamentals of computer programming, construction of numerical models, and interpretation of data within the context of numerical models. Students will be able to generate data summary statistics and visualizations, develop models representing environmental processes, integrate models with data to extrapolate results, document reproducible analysis pipelines, and give/receive constructive feedback.

Materials and Supply Fees

Not applicable.

Professional Component (ABET):

This course contributes 3 credits towards engineering topics.

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	Medium
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	
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	

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	High
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Low

Required Textbooks and Software

- Laptop computer (students must have administrator privileges). Bring to class!
- Open Source Software:
 - R (>3.5.3): A language and environment for statistical computing. R Core Team (2019). R Foundation for Statistical Computing, Vienna, Austria. URL: <https://www.R-project.org/>.
 - RStudio: Integrated Development for R. RStudio Team (2015). RStudio, Inc., Boston, MA URL <http://www.rstudio.com/>.
 - Git (Windows: <https://gitforwindows.org/>) (Macs: install Xcode)
- Course notes and material are developed by the instructor.

Recommended Textbooks and Software

- Wickham, H. Advanced R. (2019). 2nd Edition. ISBN-13: 978-0815384571. Available: <https://adv-r.hadley.nz/>
- Thomas Wright and Naupaka Zimmerman (eds): "Software Carpentry: R for Reproducible Scientific Analysis." Version 2016.06, June 2016, <https://github.com/swcarpentry/r-novice-gapminder>, 10.5281/zenodo.57520.

Course Schedule

Week 1: Getting to know your tools – Introduction to R, LaTeX, and command line

Week 2: What is a computer? – A history of computing, logic, and Turing machines

Week 3: Text parsing and I/O – regular expressions and working with strings

Week 4-5: Discretizing the continuous – numerical precision, slicing, aggregation, event extraction, interpolation, and diffusion

Week 6-7: Mathematics as descriptions – Monotonic, saturation, catalytic, oscillating, polynomials, and diffusion

Week 8: Constructing noisy simulations – Convolution of functions and noise

Week 9: Model-data integration – measure functions and minimization

Week 10-11: Data exploration – Climate and weather

Week 12-13: Data exploration – Water and thermodynamics

Week 13-14: Data exploration –Biogeochemistry and nutrients

Week 15: Final project due

*Expect weekly homework assignments in weeks 1-9, 3 data reports will be associated with the data exploration weeks, and one final project.

Attendance Policy, Class Expectations, and Make-Up Policy

Students are responsible for the material covered in class, however no attendance will be recorded. It is strongly recommended that students attend both lecture and labs. Students should bring a fully charged laptop to class, especially for labs.

Students are expected to contribute to a distraction free learning environment, and students responsible for disruptions in class may be asked to leave.

Arrangements for missed assignments should be made as soon as possible (preferably in advance). Unavoidable and unannounced missed work will be considered on a case by case basis, but may result in a failing grade.

Homework can be resubmitted for up to a 60% improvement in grade. For example: if you scored 60/100 on homework one you can recover up to $24 = 40 \times 0.6$ points with a resubmission for a maximum grade of 84/100. Missed assignments can always be submitted for a maximum of 60/100 credit.

Data reports are worth 60 points for the initial submission, 10 points each for two peer reviews, and 20 points for reply to reviewers.

The final project will consist of a model-data integration project. Initial scoping for the project will be due week 10 (10 points). A list of figures and preliminary model description will be due week 12 (10 points). Initial project report will be due week 13 (30 points). Two peer reviews will be due week 14 (2 x 15 points). Final report and reply to reviewers will be due week 15 (20 points).

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets (9)	100 each	33%
Data reports (3)	100 each	33%
Final project	100	34%
		100%

Grading Policy

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>.