

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____
	Department Civil, Environmental & Geomatics Engineering College College of Engineering & Computer Science		Confirmed _____ Banner Posted _____ Catalog _____
Current Course Prefix and Number CES 6119		Current Course Title Finite Element Methods in Civil Engineering	
<i>Syllabus must be attached for ANY changes to current course details. See <u>Guidelines</u>. Please consult and list departments that may be affected by the changes; attach documentation.</i>			
Change title to: Change prefix From: To: Change course number From: To: Change credits* From: To: Change grading From: To: <small>*Review Provost Memorandum</small>		Change description to: Change prerequisites/minimum grades to: None Change corequisites to: None Change registration controls to: Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.	
Effective Term/Year for Changes: Fall 2019		Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Ramesh Teegavarapu, 7-3444			
Approved by Department Chair _____ College Curriculum Chair _____ College Dean _____ UGPC Chair _____ UGC Chair _____ Graduate College Dean _____ UFS President _____ Provost _____		Date 3/11/2019 3/11/19 3/11/2019 _____ _____ _____ _____	

Email this form and syllabus to UGPC@fau.edu one week before the UGPC meeting.

**Department of Civil Environmental and Geomatics Engineering
Florida Atlantic University
Course Syllabus**

1. Course title/number, number of credit hours	
CGN4930/CES 6119 Finite Element Methods in Civil Engineering	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: None	
3. Course logistics	
<i>Term:</i> Summer 2018 This is a classroom lecture course <i>Class location and time:</i> MW 2:00 - 5:00 pm, FL427.	
4. Instructor contact information	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Yan Yong, Professor Utility Building (Bldg 5), Room 135 MW 1:00-3:00 pm 561-297-3445 yongy@fau.edu
5. TA contact information	
<i>TA's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	N/A
6. Course description	
Variational principles, weighted residual methods, convergence criteria, shape functions for one-, two-, and three-dimensional elements, isoparametric elements, and applications to structural and geotechnical engineering systems.	
7. Course objectives/student learning outcomes/program outcomes	
<i>Course objectives</i>	
<i>Student Learning Outcomes</i>	
8. Course evaluation method	
CGN 4930 Homework 10% Common project 20% Midterm 35% Final Exam 35%	CES 6119 Homework 10% Common project 10% Special project 10% Midterm 35% Final Exam 35%
9. Course grading scale	
The grading is based on the overall performance as related to course objectives and outcomes.	

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10. Policy on makeup tests, late work, and incompletes
<ol style="list-style-type: none"> 1. <i>Late work</i> is not acceptable. 2. <i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.
11. Special course requirements
None
12. Classroom etiquette policy
<p>University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions. Students walking out the classroom during lecture are not allowed to return except for medical conditions.</p>
13. Disability policy statement
<p>In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.</p>
14. Honor code policy
<p>Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf</p>
15. Counseling and Psychological Service (CAPS) Center
<p>Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/</p>
16. Required texts/reading
<ol style="list-style-type: none"> 1. A First Course in the Finite Element Method, 5th Edition, Daryl L. Logan file:///C:/Users/yongy/Downloads/DarylL.LoganAFirstCourseintheFiniteElementMethod%20(2).pdf
17. Supplementary/recommended readings
None
18. Course topical outline, including dates for exams/quizzes, papers, completion of reading

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05-14-18 05-16-18	1.4-1.7 2.1-2.6
05-21-18 05-23-18	3.1-3.2 3.3-3.7
06-04-18 06-07-18	3.8 – 3.11 3.12-3.13
06-11-18	4.1-4.4
06-28-18 06-30-18	4.5-4.8 5.1-5.4
07/02/2018	Midterm
07-09-18 07-11-18	5.5-5.6 6.1-6.3
07-16-18 07-18-18	6.4-6.6 7.1-7.5
07-23-18 07-25-18	8.1-8.3 9.1-9.3
07-30-18 08-01-18	10.1-10.3 10.4-10.5
08/03/2018 (9:00-12:00 pm)	Final Exam

19. Assignment Presentation (Required Format)

All assignments (i.e., homework, projects, etc) to be completed by students attending courses offered by the Civil Engineering Department must be presented in a standardized format.

Any assignments that do not comply with the following guidelines will not be accepted.

1. The assignment must be written in an 8.5 x 11 inches **engineering paper**. The problem narrative must not be repeated in the assignment sheet. However, the problem number from the textbook must be given as well as the **GIVEN** conditions and the **FIND** (whatever the problem is asking for) must be listed briefly. If homework is a handout, attach the handout at the front of the homework.
2. Each page must have:
 - (a) Course Number and Name (e.g., ENV-4001 Environmental Engineering and Science) at the top center,
 - (b) Assignment Number (e.g. HW#5) at the top left,
 - (c) Student's Name (e.g., J.M. Dover) at the top right, and
 - (d) Page Number and Total Number of Pages (e.g. 2/3) at the bottom center.
3. The text and computations in the assignment must be written in a professional manner, i.e.:
 - (a) Any derivations of formulas/equations, symbols, etc must be properly explained,
 - (b) Any assumptions/simplifications made must be mentioned and justified,
 - (c) The solution must be written in reasonable sequence,
 - (d) The final result(s) must be given at the end of the problem written within a box,
 - (e) Half way "solutions" are not acceptable,
 - (f) Just mentioning the solution algorithm/process of the problem is not acceptable; all of the computations must be carried to the very end, and
 - (g) Any unsuccessful initial attempts of solving the problem must be kept out of the assignment submitted.
4. The assignments must be presented also in a legible and well-written manner. The handwriting must be neat otherwise the assignment must be typed.
5. The assignment sheets must not be creased or folded but be stapled together at the upper left corner.

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20. Sample Assignment format

HW#5 **ENV-3001 Environmental Engineering and Science** **J.M. Dover**

Problem #3.24 (Doe, J.R. "Fundamentals of Environmental Engineering", 1999)

GIVEN: Min value of Oxygen Sag = 3.0 mg/L

Naturally Occurring DO in the stream = 10 mg/L

Min allowable DO = 5.0 mg/L

Reaeration coefficient = 0.80/day

Deoxygenation Coefficient = 0.20/day

Stream velocity = 60 miles/day

FIND: (a) Percentage of BOD that must be treated to ensure healthy environmental conditions

(b) How far downstream in miles the lowest DO would occur?

SOLUTION:

a) The minimum DO of 3.0 mg/L means that the maximum deficit (before fixing it) is

$$DO_{\max} = 10 - 3 = 7 \text{ mg/L}$$

For healthy conditions, the DO_{\min} should be 5 mg/L so that the new DO_{\max} should be

$$DO_{\max(\text{new})} = 10 - 5 = 5 \text{ mg/L}$$

$$\text{Then } DO_{\max} / DO_{\max(\text{new})} = 5.0 / 7.0 = 0.71$$

ANSWER:

Thus, 29% of the BOD needs to be removed. Since a primary treatment plant removes about 35% of the BOD (Chapter 3, pp 76) then **it would be enough.**

b) Using Eq. (5.34) the critical time and distance downstream are given as:

$$\text{Critical time: } t_c = \ln(k_r/k_d)/(k_r - k_d) = \ln(0.8/0.2)/(0.8 - 0.2) = 2.31 \text{ days}$$

$$\text{Distance: } L = 60 \text{ mi/day} \times 2.31 \text{ days} = 138.6 \text{ miles}$$

ANSWER:

Critical time is **2.31 days**; Distance is **138.6 miles**