Cover Sheet: Request 15244

ESI3327C Matrix and Numerical Methods

Info

Process	Course|Modify|Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Serdar Kirli kirli@ise.ufl.edu
Created	8/27/2020 7:19:29 PM
Updated	10/2/2020 9:40:38 PM
Description of request	Credit Reduction from 4 to 3 Minor modification to Course Description Replacing the MAP3202 pre-requisite with MAS3114

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Industrial and Systems Engineering 19060000	Serdar Kirli	New request (ESI3327C)	8/27/2020
ESI3327C Syllabus.pdf					8/27/2020
College	Recycled	ENG - College of Engineering	Heidi Dublin	Tabled per department	9/6/2020
No document changes					
Department	Approved	ENG - Industrial and Systems Engineering 19060000	David Kaber	Credit hour reduction and pre-req. change. Requiring CLA as pre-req. allows for reduction of theory content as part of course.	9/20/2020
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by the HWCOE Curriculum Committee	10/2/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			10/2/2020
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 15244

Info

Request: ESI3327C Matrix and Numerical Methods
Description of request: Credit Reduction from 4 to 3
Minor modification to Course Description
Replacing the MAP3202 pre-requisite with MAS3114
Submitter: Serdar Kirli kirli@ise.ufl.edu
Created: 9/12/2020 1:16:40 PM
Form version: 3

Responses

Current Prefix ESI
Course Level 3
Number 327
Lab Code C
Course Title Matrix and Numerical Methods in Systems Engineering
Effective Term Fall
Effective Year 2021
Requested Action Other (selecting this option opens additional form fields below)
Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? No

Change Transcript Title? No

Change Credit Hours? Yes
Current Credit Hours 4
Proposed Credit Hours 3
Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Change Course Description? Yes
Current Course Description Theory and application of vector, matrix, and other numerical methods to systems problems. Simultaneous linear equations, characteristic values, quadratic forms, error

analysis, use of series, curve fitting, nonlinear equations, and discrete methods. Laboratory emphasizes numerical solutions using MATLAB.
Proposed Course Description (500 characters max) Theory and application of vector, matrix and other numerical methods to systems problems. Simultaneous linear equations, characteristic values, quadratic forms, error analysis, use of series, curve fitting, nonlinear equations, discrete methods. The laboratory sessions will emphasize numerical solutions using common programming languages.
Change Prerequisites? Yes
Current Prerequisites MAC 2313 (C) & MAP 2302 (C)
Proposed Prerequisites MAC 2313 (C) & MAS 3114 (C)
Change Co-requisites? No

Rationale The proposed changes intend to strengthen the coverage of core concepts in the area of linear algebra, matrix methods and numerical methods.
The ISE faculty strongly believes that including MAS3114 in our curriculum is necessary due to the fact that it covers the fundamental concepts necessary not only for ESI3327C but also for the ISE core courses ESI3312 and ESI4313. On the other hand, the topics covered in MAP2302 are not encountered much in our upper division courses any more.
MAS3114 (Computational Linear Algebra) lays the foundation in Linear Algebra and its addition to the curriculum enables a reduction of material covered in ESI3327C, particularly due to the overlap in Linear Algebra. Consequently, 3 credits will be sufficient to cover the intended material (matrix methods and numerical methods). It is important to note that as a result of proposed change, the number of credits allocated to the areas of Linear Algebra, matrices and numerical methods will effectively increase from 4 credits to 6 credits. The credit freed up from the credit reduction in ESI3327C will increase the elective credits.
The proposed change to the course description involves the replacement of a specific software tool (MATLAB) with a more general description ("common programming languages") which adds flexibility with respect to the specific programming language(s) used in this course.

Matrix and Numerical Methods in Systems Engineering
ESI 3327C Section xxxx
Academic Term*:* Fall 2021

Instructor:
Dr. Sanaz Motamedi
Email Address: smotamedi @ufl.edu
Office location: 378 Weil Hall
Office Hours: Monday, Wednesday 2:30 pm-3:30pm (or by appointment)

Teaching Assistant:
To be determined

Meeting Times and Location
MWF 10, FLG 0230

Course Description
Theory and application of vector, matrix and other numerical methods to systems problems. Simultaneous linear equations, characteristic values, quadratic forms, error analysis, use of series, curve fitting, nonlinear equations, discrete methods. The laboratory sessions will emphasize numerical solutions using common programming languages.

Course Pre-Requisites/Co-Requisites
- MAC2313 with a minimum grade of C
- MAS3114 a with minimum grade of C

Course Objectives
- To understand the underlying fundamental ideas behind numerical methods and the concepts behind the techniques presented in the course.
- To grasp the analysis of algorithms, computational complexity, and other concepts and modern developments in numerical methods
- To develop facility with the techniques themselves, and to be able to solve small size problems analytically
- To learn how to implement the methods in common programming environments

Recommended Textbooks
- Title: **Introduction to Linear Algebra**
- Author: Gilbert Strang
- Wellesley Cambridge Press, 5th edition

- Title**: Numerical Methods and Optimization: An Introduction**
- Authors: S. Butenko and P. Pardalos
- Chapman and Hall, 1st edition

Materials and Supply Fees
N/A

Original file: ESI3327C Syllabus.pdf

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. Identify, formulate, and solve engineering problems	High
2. Apply engineering design … consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors	
3. Communicate effectively with a range of audiences	
4. Recognize ethical and professional responsibilities … impact of engineering solutions in global, economic, environmental, and societal contexts	
5. Function effectively on a team … provide leadership, create a collaborative and inclusive environment …	
6. Develop and conduct appropriate experimentation, analyze, and interpret data …	
7. Ability to acquire and apply new knowledge as needed …	

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

Attendance Policy
Attendance is very strongly encouraged - you are responsible for the announcements made in class. Students are expected to know the material covered in the prerequisite courses. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

This is not a course where you can do well on exams solely by blindly applying formulas. In order to get the most out of the course, try to stay ahead. By the weekend, make sure you have at the least reviewed the material covered in the lectures and readings of the preceding week. In addition to reading, working out extra exercises on your own will help in improving your understanding of the material. With diligent practice, you can prepare yourself to the point where, on exams, instinct takes over and the problems seem straightforward.

Make-Up Policy:
Excused absences are consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Course Schedule (Tentative Schedule)

Week	Chapter/Book	Notes
1	Vectors and Matrices: Review	
2	Linear Algebra: review	
3	Linear Algebra: review	Quiz 1
4	Computing Eigenvalues and Eigenvectors	Lab 1
5	Numerical Methods: Introduction	***Exam 1,*** HW1
6	Direct Methods for Solving Linear Systems	
7	Iterative Methods for Solving Linear Systems	
8	Iterative Methods for Solving Nonlinear Equations	Quiz 2
9	Iterative Methods for Solving Nonlinear Equations	Lab 2
10	Polynomial Interpolation	***Exam 2,*** HW2
11	Numerical Integration	
12	Numerical Solutions of Differential Equations	Lab 3
13	Basic Concepts of Optimization	Quiz 3, HW3
14	Complexity Issues	
15	Review and Exam	HW 4, ***Exam 3***

Evaluation of Grades

Assignment	Percentage of Final Grade
Homework Sets	30%
Quizzes	25%
Exam 1	15%
Exam 2	15%
Exam 3	15%
	100%

Exams:
There will be 3 exams held during regular class hours. The exams will be announced one week in advance (the dates mentioned in the chart are "tentative"). You are allowed to bring a one-page (US letter size) one-sided handwritten formula sheet. You are not allowed to use your textbooks or any published material during the exam.

Homeworks:
Homework will be announced one week in advance. Submissions after the due date will not be accepted. All homework solutions will be posted on Canvas.

Quizzes:
Quizzes will test concepts taught in the previous class or week. Each quiz will be announced one-week in advance.

Labs:
Labs are not graded. They cover programming basics and provide valuable hands-on experience. What you learn in the labs will be useful in homeworks and exams.

Grading Policy

This is a critical tracking course. Therefore, a "C-" is not a qualifying grade. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (\C" or better). Note: a "C-" average is equivalent to a GPA of 1.67. For more information on grades and grading policies, please visit: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Percent	Grade	Grade Points
93.0 - 100	A	4.00
90.0 – 92.9	A-	3.67
87.0 – 89.9	B+	3.33
83.0 – 86.9	B	3.00
80.0 - 82.9	B-	2.67
77.0 - 79.9	C+	2.33
73.0 – 76.9	C	2.00
70.0 - 72.9	C-	1.67
67.0 - 69.9	D+	1.33
63.0 - 66.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://gatorevals.aa.ufl.edu/. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://gatorevals.aa.ufl.edu/. 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/.

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 Undergraduate 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@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.

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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

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: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

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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 suppor*t*, 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.