

Cover Sheet: Request 12040

ESI 4327C Matrix and Numerical Methods in Systems Engineering

Info

Process	Course Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Serdar Kirli kirli@ise.ufl.edu
Created	11/8/2017 4:11:40 PM
Updated	12/10/2018 1:53:25 PM
Description of request	This request is only about changing the first digit of the course number from 4 to 3, making this a 3000 level course. Everything else (content, contact hours, pre-requisites) will remain unchanged.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Industrial and Systems Engineering 011906000	Ageliki Elefteriadou		12/7/2017
No document changes					
College	Recycled	ENG - College of Engineering	Heidi Dublin	Description of request should describe change being made. Please add syllabus	1/5/2018
No document changes					
Department	Approved	ENG - Industrial and Systems Engineering 011906000	Ageliki Elefteriadou		5/3/2018
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	approved by hwcoe curriculum committee	10/1/2018
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Lee Morrison	Added to November agenda.	11/19/2018
No document changes					
University Curriculum Committee	Recycled	PV - University Curriculum Committee (UCC)	Casey Griffith	Please contact Office of the Associate Provost of Undergraduate Affairs regarding requested changes.	11/27/2018
No document changes					
College	Recycled	ENG - College of Engineering	Heidi Dublin	Please see comments.	11/27/2018
No document changes					
Department	Approved	ENG - Industrial and Systems Engineering 011906000	Serdar Kirli	UCC comments addressed	12/7/2018
ESI4327C_MatrixNumericalMethods.pdf					
College	Approved	ENG - College of Engineering	Heidi Dublin	Department indicated that concerns were addressed.	12/10/2018
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			12/10/2018
No document changes					

Step	Status	Group	User	Comment	Updated
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 12040

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Description of request: This request is only about changing the first digit of the course number from 4 to 3, making this a 3000 level course. Everything else (content, contact hours, pre-requisites) will remain unchanged.

Submitter: Serdar Kirli kirli@ise.ufl.edu

Created: 12/7/2018 11:30:13 AM

Form version: 4

Responses

Current Prefix ESI

Course Level 4

Number 327

Lab Code C

Course Title Matrix and Numerical Methods in Systems Engineering

Effective Term Earliest Available

Effective Year 2018

Requested Action Other (selecting this option opens additional form fields below)

Change Course Prefix? No

Change Course Level? Yes

Current Level 4

Proposed Level 3

Change Course Number? No

Change Lab Code? No

Change Course Title? No

Change Transcript Title? No

Change Credit Hours? No

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? No

Change Prerequisites? No

Change Co-requisites? No

Rationale This is a critical tracking course for students in Industrial and Systems Engineering. Consequently, it must be completed within 5 semesters after entering UF. In the 8-semester suggested course plan in the undergraduate catalog, it appears in the 4th semester. Therefore, it is more appropriate to designate it as a 3000-level course. This change does not impact curriculum plans or required courses for students. There is no need to modify course content.

Matrix and Numerical Methods in Systems Engineering
ESI 4327C Section 5201
Academic Term: Spring 2018

Instructor:

Distinguished Professor Panagote (Panos) M. Pardalos, <http://www.ise.ufl.edu/pardalos/>
Email Address: pardalos@ufl.edu
Office location: 401 Weil Hall
Office Hours: by appointment

Teaching Assistant:

Arsenios Tsokas
Office location: 406 Weil Hall
Email address: artsokas@ufl.edu
Office hours: TBD

Course Description

Catalog 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 on numerical solutions using MATLAB.

Course Pre-Requisites / Co-Requisites

MAC 2313, MAP 2302 with minimum grades 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 the MATLAB programming environment (ability to program in at least one high level language such as C, C++, FORTRAN, VB, etc. will be useful, but is not a requirement).

Meeting Times and Location

M, W | Periods 9-10 (4:05 PM - 6:00 PM), FLG 0280
F | Period 9 (4:05 PM - 4:55 PM), FLG 0280

Materials and Supply Fees

N/A

Professional Component (ABET):

This course teaches the basic concepts in the theory and applications of vector, matrix and other numerical methods to systems problems. Students will develop and enhance their ability to address various problems applying numerical methods and modern software (MATLAB).

Relation to Program Outcomes (ABET):

Outcome	Coverage*
a. an ability to apply knowledge of mathematics, science, and engineering	High
b. an ability to design and conduct experiments, as well as to analyze and interpret data	
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
d. an ability to function on multidisciplinary teams	
e. an ability to identify, formulate, and solve engineering problems	
f. an understanding of professional and ethical responsibility	
g. an ability to communicate effectively	
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
i. a recognition of the need for, and an ability to engage in life-long learning	
j. a knowledge of contemporary issues	
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	Medium

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

Recommended Textbooks

- Title: **Introduction to Linear Algebra**
- Author: Gilbert Strang
- Wellesley Cambridge Press, 4th edition

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

Course Schedule

The course Schedule is offered as a guide. This means that it is subject to change, depending on the pace of the class. The instructor might choose to cover parts of the curriculum more extensively, or give extensions to deadlines. The dates of the exams might be subject to change depending on the progress of the class.

Week	Chapter/Book	Exam
1	Introduction; Vectors and Linear (Vector) Spaces	
2	Matrices and Their Properties	
3	Determinants, Trace and Rank	
4	Inverses of Nonsingular Matrices	
5	Eigenvalues and Eigenvectors	Exam 1
6	Quadratic Form; Matrix Norms	
7	Numbers and Errors; Conversion Between Systems	

8	Direct Methods for Solving Linear Systems	
9	Spring Break	
10	Iterative Methods for Solving Linear Systems	
11	Computing Eigenvalues and Eigenvectors	Exam 2
12	Iterative Methods for Solving Equations	
13	Polynomial Interpolation; Numerical Integration	
14	Numerical Solutions of Differential Equations	
15	Basic Concepts of Optimization	
16	Complexity Issues	Exam 3

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. When necessary, they are expected to relearn material from these courses on their own.

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.

Exam Policy

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/ugrad/current/regulations/info/attendance.aspx>.

Evaluation of Grades

Your performance in the course will be evaluated based on three in-class exams and on homework assignments, as follows:

- (a) Homework: **25%**
- (b) Exam 1: **25%**
- (c) Exam 2: **25%**
- (d) Exam 3: **25%**

Homework assignments will be given on a regular basis. The three exam are tentatively scheduled as follows:

Exam 1 date: Wednesday, February 7

Exam 2 date: Wednesday, March 21

Exam 3 date: Wednesday, April 25

Exam Grading Appeals: every effort will be made to ensure that grading is as objective and fair as possible. If you believe that there is an error in the grading, please submit, in writing, an appeal within one week of your exam being returned. However, please be advised that if you submit such an appeal, the entire exam will be regraded to ensure that all parts are properly graded. As such, your grade on the exam could increase or decrease based on the secondary grading.

Grading Scale

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 feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. 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://evaluations.ufl.edu/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://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.

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

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

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 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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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