MAS 3114
SPRING 2017

SYLLABUS

COURSE TITLE: Computational Linear Algebra

CATALOG DESCRIPTION: Linear equations, matrices, and determinants; vector spaces and linear transformations; inner products and eigenvalues. This course emphasizes computational aspects of Linear Algebra.

COURSE CONTENT: MAS 3114 is designed to serve science, computer science, quantitative science, engineering majors, and mathematics minors. Mathematics majors are required to take MAS 4105.

MAS 3114 is a 3-credit course on linear algebra whose topics are of a computational nature. The topics include linear equations, matrices, determinants, vectors, vector spaces, linear transformations, inner products, eigenvalues, and applications.

Computer projects are assigned (5 per semester). We require the students to learn MATLAB, a programming environment, for the projects. Proofs are not stressed as much as in MAS 4105 Linear Algebra 1.

PREREQUISITES: familiarity with a programming language and a grade of a C or better in MAC 2312.

INSTRUCTOR: **Dr. Larissa Williamson**
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Office Hours: M 9, W 8-9, F 8
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E-learning (Canvas): https://lss.at.ufl.edu/

The course is divided into **5 units**:

Unit 1	M01 – M06	Linear Systems
Unit 2	M07 – M14	Matrices & Determinants
Unit 3	M15 – M21	Vector Spaces & Bases
Unit 4	M22 – M26	Eigenvalues & Eigenvectors
Unit 5	M27 – M32	Orthogonal Sets & Linear Models

FINAL EXAM: M01 – M32

Course Calendar

MAS 3114 – Section 07HF

Spring 2017	Monday	Tue	Wed	Thursday	Friday
January	2	3	4 M1	5	6 M2
	9 M3	10	11 M4	12 Modules1-3 due	13 M5
	16 Martin Luther King Day	17	18 M6	19 Modules4-5 due	20 Review 1
	23 **Exam1:M1-6**	24	25 M7	26 Module 6 due	27 **Project 0 due** M8
February	30 M9	31	1 M10	2 Modules 7-9 due	3 **Project 1 due** M11
	6 M12	7	8 M13	9 Modules10-12 due	10 M14
	13 Review 2	14	15 **Exam2:M7-14**	16 Modules13-14 due	17 M15
	20 M16	21	22 M17	23 Modules15-16 due	24 **Project2 due** M18
March	27 M19	28	1 M20	2 Modules17-19 due	3 M21
	S P R I N G B R E A K March 4 – March 11				
	13 Review3	14	15 **Exam3:M15-21**	16 Modules20-21 due	17 M22
	20 M23	21	22 M24	23 Modules22-23 due	24 **Project3 due** M25
	27 M26	28	29 Review4	30 Modules24-26 due	31 **Exam4:M22-26**
April	3 M27	4	5 M28	6 Module 27 due	7 M29
	10 M30	11	12 **Project4 due** M31	13 Modules28-30 due	14 M32
	17 Review 5 Modules31-32 due	18 **Quiz: M27-M32**	19 **Final Exam: M1-M32**	20 No Class	21 No Class

TEXTBOOK & ACCESS CODE:

1) We use the following textbook in this course:

Linear Algebra and Its Applications, 5th edition,
by David C. Lay, Steven R. Lay, Judi J. McDonald**

2) Access code to **MyLab & Mastering** is required in the course.
An access code can be obtained through authorizing charges to your student financials account and is provided at a discounted price**
You must authorize charges on or before 11:59 PM on Tuesday, January 24, 2017. If you do not wish to authorize charges to your student financials account or if it is after 11:59PM on Tuesday, January 24, 2017, you may purchase an access code at the bookstore instead.

* Registration with MyLab gives you an access to an electronic version of the textbook. If you wish to purchase a print text you may also purchase those at the bookstore at a discounted price.
**Please see Course Materials and Registration Instructions on Canvas for complete information on obtaining an access code to MyLab through authorizing charges to your student financial account.

LECTURE NOTES: Lecture note shells make the note taking easier and are required in the course. They can be printed from Canvas at https://lss.at.ufl.edu/ (under **Lecture Notes**) or purchased at Target Copy (1412 W University Ave, Gainesville, FL 32603).

MODULES & DUE DATES: It is advisable to complete a module on the date indicated in the Calendar so that you will stay on track and avoid having too many Modules to complete by the Due Date. Each Module# becomes available at least 1 week prior to the date marked M# in the Calendar and will be closed on the Due Date at 11:59 pm ET. The assignments, which are required to be completed for each Module, include On-line Homework within MyLab & Mastering.

REVIEW: The dates indicated in the calendar as "Review" are the due dates for Review Modules. Working on the Review modules will help you to prepare for exams and the quiz.

EXAMS & QUIZ: There will be four Unit Exams, one Quiz, and an optional Final Exam offered during the term. Each Unit exam covers the corresponding Unit, the Quiz covers Unit 5, and the optional Final is cumulative – it covers Units 1-5. All exams for this course will be given on the date indicated in the calendar during the regular class time in the lecture hall. The Quiz is mandatory and has to be completed within MyLab and Mastering on the date indicated in the Calendar. All exams are multiple-choice and will be machine graded on a scale from 0 to 60. The Quiz is also multiple-choice and will be graded by the software upon submission on a scale from 0 to 60 points.
It may be necessary to miss an Exam during the term or you might not be satisfied with one of your grades earned on the Unit Exams. For these reasons, an OPTIONAL FINAL EXAM will be given on the last day of classes. The best 4 out of 5 exam scores will count.

MAKEUP POLICY ON EXAMS: **If you are missing a Unit Exam due to <u>legitimate documented circumstances</u>, you have an option either to take the Final Exam as a MakeUp or, if you wish to make it up before the last days of classes and save the Final for another test, you can schedule a makeup earlier:** please contact **Dr. Williamson** (lwill@ufl.edu) and provide the documentation at least <u>a week prior to the test</u> or <u>immediately</u> afterwards if you were sick. <u>Late excuse documentation will not be accepted.</u> No makeups will be given at the end of the term. Missing the Quiz or Final exam without appropriate documentation and taking a makeup for it will result in deduction of points at the instructor's discretion.

TEXTBOOK HOMEWORK: Textbook homework problems are assigned after each lecture. **They will not be graded** but should be considered as an additional tool for mastering the material and preparing for the Exams. A list of recommended Textbook Homework problems is located in each corresponding Module in Canvas.

TEXTBOOK READINGS: Reading the textbook is a part of learning process. The students are strongly recommended to read the corresponding sections of the textbook AFTER viewing a lecture and BEFORE doing the homework. The pages of the textbook that match the content of a lecture are listed in each corresponding Module in Canvas.

ON-LINE HOMEWORK: Each on-line **Homework** assignment (HW) is a set of problems assigned in MyLab and numbered according to the module covered. A HW assignment is due at 11:59 pm on the due date indicated in the Calendar and on MyLab Assignments page and **will be closed after the due date**. **A credit for a HW will be given according to the percent value of the correct work completed.** There will be total of 32 assignments offered and the **2 lowest scores will be dropped**.

MAKEUP POLICY ON ON-LINE HOMEWORK**:** If you missed the due date on homework on a legitimate and documented reason, you have to present a valid documentation to Dr. Williamson prior to the due date or right after you came back to school if you were sick. Late documentation will not be accepted. **No extensions on HW will be given after the due date without an appropriate documentation.**

PROJECTS: 5 computer projects will be assigned during the semester and have to be submitted in Canvas before the due dates indicated in the Calendar. All projects are to be completed by using MATLAB software. Please visit the link "MATLAB Projects" on the Canvas homepage for more information. Project 0 is worth 10 points and each of the Projects 1 – 4 is worth 30 points. Thus, up to 130 points can be earned on Projects.

IMPORTANT NOTE: Homework, exams, and projects will not be reviewed, offered, and/or accepted for grading after the end of the term. We will not accept any late excuse documentation. You have to present to your Instructor an appropriate documentation **before you miss an Exam or right after you came back to school if you were sick** to be eligible for a makeup. You can discuss a Unit Exam, project, or homework within <u>one week</u> and the Final exam – within 2 days with your instructor if there is a grading error or any other problem.

LECTURE PARTICIPATION: Starting the second week of classes, lecture participation will be taken in the lecture hall during a live lecture or review session. The students are required to register with **MyLab & Mastering** in order to use Pearson's Learning Catalytics system and get points for participation. They will access this system from Canvas by clicking on the link **MyLab & Mastering** on the left-hand panel. An active session will be shown on the MyMathLab Course Home page. The students simply click on the active session number to join. Learning Catalytics allows the Students to use their smartphone, tablet, or laptop to respond to the questions in class and their responses will be graded and recorded in the gradebook. A total of 33 sessions will be graded. There will be 2 questions per session. Each question is worth 1 point and the grade will be assigned as 75% for participation and 25% for correctness. A student will get a full credit 1.75 by attempting two questions and answering one correctly. If a student answers both questions correctly, he/she receives 2 points for the session, which includes 0.25 bonus. **The three lowest scores for participation will be dropped at the end of the term** to compensate for occasional absences, device failures, etc.

CALCULATOR POLICY: Calculators may be useful for some homework problems but are not required in the course and <u>are not allowed on the exams</u>.

SPECIAL ACCOMODATIONS: <u>Students with learning disabilities</u> should request accommodations according to the UF policy. Please check on the current status with DRC.

COURSE GRADE: The course grade is based on 572.5 points accumulated as follows:

30	Lecture Participation	@	52.5 points	9.17 %
30	On-line homework	@	90 points	15.72 %
5	Projects	@	130 points	22.71 %
1	Quiz	@	60 points	10.48 %
4	Exams	@	<u>240 points</u>	<u>41.92 %</u>
		Total:	572.5 points	100 %

The course grade is the grade satisfying the conditions below and <mark>**will be strictly adhered**</mark> to:

	Minimum %			Minimum %
A	90 %		C-	62 %
A-	86 %		D+	58 %
B+	82 %		D	54 %
B	78 %		D-	50 %
B-	74 %		E	0 %
C+	70 %			
C	66 %			

GRADE POSTING: All grades will be posted in a timing manner on E-Learning (Canvas) at http://lss.at.ufl.edu . You are advised to check regularly whether your grades are handled and recorded properly. You should immediately report any problem with your grade to your Instructor.

HELP: Please visit the **Resources & Help** link on Canvas Homepage for complete information.