MATH 540
APPLIED MATRIX ANALYSIS
Nicholls State University, Fall 2014

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My office hours are 8:30-10:30 MWF and 2:00-4:00 TTh. Please contact me (by phone, by email, or in person) during these times if you have any questions. If you need assistance at a different time, contact me and we'll work something out.

Prerequisite: MATH 360 (Linear Algebra)
Required Materials: There will be no text for this course. We will use class notes regularly posted to Moodle.

Course Description (catalog): Vector spaces and transformations, eigensystems, quadratic forms.

Course Description (instructor): This course could just as easily be called "Linear Algebra II" or "Advanced Linear Algebra". After learning the fundamentals in linear algebra, any follow-up course will necessarily involve many applications. Linear algebra is fast becoming one of the most widely used disciplines in mathematics. In fact, to some it has already supplanted calculus as the most important field.

We will begin with vector spaces and linear transformations. This material should be a review, it's covered in most linear algebra courses, but we will cover it thoroughly and go more deeply. We will follow that with a complete study of eigenvalues and then finish with a selection of topics (from quadratic forms, bilinear forms, orthogonal matrices, the least squares problem, and complex vector spaces) as time allows. Throughout the semester, we will focus on applications of linear algebra as appropriate.

A few words need to be said about the Internet aspect of this course. All assignments, notes, announcements, etc. will be posted on Moodle. All students enrolled in an Internet course should have basic computer skills (such as word processing, e-mail, navigating the Internet, etc.). I invite you to visit the distance education webpage (http://www.nicholls.edu/distance) for more information and guidance. As an online student, you will be somewhat self-paced. This therefore requires self-discipline and self-motivation. The problem sets need to be turned in on time. It is the responsibility of the student to notify the instructor of technical and/or personal problems that may interfere with online participation. Since email will be our primary means of communication, you will need to check your Nicholls email account regularly (*at least* once a day) for possible news and/or announcements. Additionally, please feel free to email me as often as is necessary if you have questions about the material. Finally, just like a typical class,

instances of academic dishonesty such as plagiarism will not be tolerated. Sanctions for such behavior are outlined in the *Code of Student Conduct* (Section 1.9).

Special Note: Section Five of the Code of Student Conduct, 'Academic Dishonesty and Disruptive Behavior,' includes a requirement that faculty file a charge complaint statement with their respective dean whenever a student is confronted or disciplined for cheating. The Office of Academic Affairs will maintain these records, and any student confronted and/or disciplined for multiple offenses of academic dishonesty will be brought before the Academic Affairs Integrity Committee for further review and potential sanctions. Please read the Code of Student Conduct for further details regarding this policy."

Course Objectives: At the completion of this course, a student will be able to:
- demonstrate knowledge of the properties of vector spaces
- describe and solve real-world problems using matrices and eigensystems
- analyze linear transformations
- analyze bilinear and quadratic forms

Grading Structure: Your course grade will be composed of a problem set grade (50%), an "in-class" midterm exam grade (25%), and a take-home final exam grade (25%). The midterm exam will obviously not actually be in-class, since we do not have class. What I mean is that it will be a typical closed-book, proctored, timed exam that students will take at a specified time and place (as opposed to a take-home exam that you can complete when and where you want during the time you are working on it). ****Distance education students need to choose an approved testing center in their local area and complete a Proctor Approval Form (soon to be located under "Course Documents") prior to taking the exam. Once the form has been uploaded, I will give you two weeks to inform me of your choice. That will allow me ample time to contact your designated proctor and approve (or not) the selection.**** Students located near campus will be able to arrange their midterm exam with me. The problem set grade will consist of fairly regular assignments, roughly one a week, such as problems to work out, discussion boards, independent research, etc.

At the conclusion of the semester, letter grades will be assigned based on the usual 10% grading scale (A: 90-100%, B: 80-89%, C: 70-79%, etc). Late assignments will not be accepted unless there are VERY unusual circumstances, and make-up exams will only be administered if the student provides a valid excuse. The instructor decides which excuses are valid and which circumstances are unusual. As I said above, academic dishonesty (i.e. cheating, plagiarism, etc.) will not be tolerated.

Important Dates
Mid-term Exam – Monday, October 6, 2014-Wednesday, October 8, 2014
'**W**' Day – Thursday, October 30, 2014
Final Exam Due – Tuesday, December 9, 2014

Academic Grievances: The proper procedure for filing grade appeals or grievances related to academic matters is listed in Section 5 of the *Code of Student Conduct* and at the following link: www.nicholls.edu/documents/student_life/code_of_conduct.pdf.

Continued Learning following an Extreme Emergency: In order to make continued learning possible following an extreme emergency

students are responsible for:
- reading regular emergency notifications on the NSU website;
- knowing how to use and access Moodle (or university designated electronic delivery system);
- being familiar with emergency guidelines;
- evacuating textbooks and other course materials;
- knowing their Moodle (or designated system) student login and password;
- contacting faculty regarding their intentions for completing the course.

faculty are responsible for:
- their development in the use of the Moodle (or designated) software;
- having a plan for continuing their courses using only Moodle and email;
- continuing their course in whatever way suits the completion of the course best, and being creative in the continuation of these courses;
- making adjustments or compensations to a student's progress in special programs with labs, clinical sequences or the like only in the immediate semester following the emergency.

Assistance with Studying and Assignments:
- The Tutoring Center at 143 Peltier Hall. Call 985-448-4100, email tutoring@nicholls.edu, or visit http://www.nicholls.edu/academic-enhancement.
- The Writing Center at 144 Peltier Hall. Call 985-448-4100, email tutoring@nicholls.edu, or visit http://www.nicholls.edu/academic-enhancement.
- Online Tutoring through Moodle. Look for the Brainfuse log-in link on the home page, http://moodle2.nicholls.edu/moodle

ADA Compliance: If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of your academic accommodations. The Office of Disability Services is located in 158A Shaver Gym. The phone number is (985) 448-4430 (TDD 449-7002).

MyMathLab is compatible with the JAWS 12 screen reader, enabling print-disabled students to read selected multiple-choice and free-response problem types, and interact with them via keyboard controls and math notation input. For low-vision students, MyMathLab works with the ZoomText enlarger. Additional information can be obtained by clicking on the link http://www.mymathlab.com/product-info.