|  |  |
| --- | --- |
| Course Title/Number | Linear Algebra |
| Semester/Year | Fall 2017 |
| Days/Time | MTWR 11:00 – 12:00 |
| Location | Smith Hall 518 |
| Instructor | Dr. Clayton Brooks |
| Office | Smith Hall 723 |
| Phone | The University does not give me full telephone access so I may not be able to return your call. So, with that in mind, my number is ×6-6702. |
| E-Mail | brooksc at … |
| Office/Hours | MW 3:00 – 4:30, TR 3:15 – 4:30 |
| University Policies | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/?page_id=802>  Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment |

**Course Description: From Catalog**

|  |
| --- |
| Vector spaces, matrices and determinants, systems of linear equations, linear transformations, eigenvalues, eigenvectors, and applications. (PR or CR: C or better in MTH 300) |

**Learner outcomes**

The student is expected to be able to:

* Manipulate vectors, both graphically and algebraically, to be able to apply them to problem solving in various areas, such as: geometry, physics, and engineering.
* Use linear systems to model a wide range of problems, solve such systems by hand, and interpret the implications of various types of solutions.
* Understand the concepts of spanning sets and linear independence, and their connections with familiar ideas.
* Work with matrices to organize data and solve linear systems, using technology to aid in the task, and be able to interpret and apply the results to real-world problems, basis issues, and linear transformations.
* Realize the basic potential numerical problems of working with technology and large matrices, and avoid processes that are unnecessarily inefficient.
* Be able to determine eigenvalues and eigenvectors of matrices, and make connections with other aspects of linear algebra.
* Understand the basic concept of orthogonality in higher dimensions, and such spaces can be computed using previously learned techniques.
* Understand the concept of vector spaces in the context of both real numbers and abstract definitions, making strong connections with familiar concepts.

**Assessment of learner outcomes**

The student will be expected to:

* Solve problems of various levels of complexity and application under traditional exam situations. Furthermore, sections of the exams will require the use of technology but some section will prohibit its use. The purpose of such a format is to determine both conceptual and applicational aspects independently.
* If given time, an oral may be given. This is to allow the instructor to individually assess the conceptual level of each student by altering the questions based upon the student’s answers and other reactions.
* Present answers to problems in class on a frequent basis. The purpose is to assess the ability of the student to be able to explain concepts to a group unfamiliar to the subject, but at the level to become familiar. The other purpose is that the rest of the class must put forth probing questions because the class knows that the presenter is not an expert in the field. Thus, it cannot be assumed that the presentation is entirely accurate or complete. The student will give, each appropriate class, an index card to the instructor, informing the instructor on what problems the student has acceptable competency to be able to present. Even so, a student may still be called upon for the presentation of any problem.
* Turn in small projects for the purpose of determining if the student has a thorough, if basic, idea of any in-depth concepts that cannot be achieved in the short time frame of an exam or class presentation.

**Required Texts, Additional Reading, and Other Materials**

|  |
| --- |
| 1. Linear Algebra and its applications by David Lay, 4th edition 2. TI-84 calculator or equivalent 3. You need to have access to the University’s computers, which you should if you are a registered student. We will go to the 5th floor lab at least once to familiarize you to a program called MATLAB. |

**Course Requirements / Due Dates (tentative)**

|  |
| --- |
| 1. Midterm Exam – October 12 (10:00 – 11:50 in SH 614) 2. Final exam – December 1? (10:15 – 12:15) |

**Class presentations**

|  |
| --- |
| If possible, depending on the class size and dynamics, a significant portion of class time will be devoted to student presenting solutions to problems in front of the class. The class will critique and correct any error or ambiguities. Credit will only be given for correct presentations, and this will make up the bulk of the non-exam grade. All successful presentations must be followed up with a written version. |

**Grading Policy**

|  |
| --- |
| The weights given to aspects of the class are:  35% Daily class presentations, discussion, and homework  30% Midterm exam  35% Final exam  A letter grade, with possible plusses and minuses, will be given for each aspect. The final grade will be an average of those aspects.  A penalty of 1% reduction for each hour late will be assessed for any assignment. Make-up tests will not be given for any unexcused absence. |

**Attendance Policy**

|  |
| --- |
| There is no formal attendance policy other than the one listed in the Undergraduate Catalog. However, being absent for exams and class presentations and discussions inherently carries potentially severe penalties. |