

DEPARTMENT OF MATHEMATICS, PHYSICS AND COMPUTER SCIENCE

**COURSE SYLLABUS**

for

**MATH 310-11**

**Linear Algebra**

**3.00 s.h.**

**FALL SEMESTER 2014**

**PROFESSOR:**    **Dr. Tyler Markkanen**  
Room 121 Schoo-Bemis Hall  
Office Phone: 413-748-3228  
Email: [tmarkkanen@springfieldcollege.edu](mailto:tmarkkanen@springfieldcollege.edu)

**LECTURE CLASS TIMES & LOCATION:**

MWF 1:00 - 1:50 PM            MAIN/SBSC/113

**TEXTS FOR THE COURSE:**

Linear Algebra (w/MyMathLab Getting Started Kit) Edition: 4th  
Author: Lay  
Edition: 4<sup>th</sup>  
Publisher: Pearson Education Inc.

**PROFESSOR'S OFFICE HOURS:**

Mondays 10-11 AM  
Tuesdays & Fridays 8-9 AM  
Wednesdays 2-3 PM  
Thursdays 3-4 PM  
Or by appointment  
(Any changes to these office hours will be posted on Moodle.)

**COURSE DESCRIPTION:**

This course includes the notation, terminology, algebra of, interpretation of, and applications of vectors and matrices. More abstract ideas, vector spaces, and characteristic roots are also covered.

Credits: 3

**Specific Learning Objectives and Methods of Assessment:**

<b>Specific Learning Objective:</b>	<b>Methods of Assessment:</b>
<ol style="list-style-type: none"><li>1. To become proficient in the standard techniques of solving and manipulating systems of linear equations.</li><li>2. To solve problems involving the following topics (time permitting):<ol style="list-style-type: none"><li>a. systems of linear equations</li><li>b. matrices</li></ol></li></ol>	All of the learning objectives will be assessed in the following ways:  Homework

c. determinants	Quizzes
d. vector spaces	
e. eigenvalues and eigenvectors	Exams
f. inner product spaces	
3. To use technology (especially involving linear systems and matrix calculations) to help solve problems, experiment, interpret results, and verify conclusions.	
4. To be able to recognize when to use the tools of linear algebra in applications from various fields.	
5. To appreciate and apply the theory behind the techniques of linear algebra, in case of errors that one needs to recognize and correct and to be better able to program something that suits one's needs better and runs faster.	

### **TEACHING METHOD**

1. Lecture;
2. Homework help & hints (Approximately 5-10 minutes, most meeting times);
3. Frequent problem-solving by students at their desks individually;
4. Occasional problem-solving by students at their desks in pairs or small groups;
5. Occasional presenting of homework problems by students at the board individually.

### **GRADING SCHEDULE FOR THE COURSE:**

<b>Grading Category</b>	<b>Percentage of Grade</b>
Homework	20%
Quizzes	15%
Exams	45% (15% each)
Final Exam	20%

Letter grades will be determined according to the following scale.

<b>≥ 93</b>	<b>A</b>	<b>79 - 82</b>	<b>B -</b>	<b>67 - 68</b>	<b>D +</b>
<b>89 - 92</b>	<b>A -</b>	<b>77 - 78</b>	<b>C +</b>	<b>63 - 66</b>	<b>D</b>
<b>87 - 88</b>	<b>B +</b>	<b>73 - 76</b>	<b>C</b>	<b>57 - 62</b>	<b>D -</b>
<b>83 - 86</b>	<b>B</b>	<b>69 - 72</b>	<b>C -</b>	<b>&lt; 57</b>	<b>F</b>

### **MOODLE:**

Visit our course webpage by going to Moodle. You can get to Moodle in one of the following two ways:

1. Go to the Springfield College's main website ([www.springfieldcollege.com](http://www.springfieldcollege.com)) and log in to PrideNET. Then click on the "Moodle" tab at the top of the screen and follow the onscreen instructions.

OR...

2. Go to <https://scmoodle2.springfieldcollege.edu/> and log into Moodle directly. If you choose this method, you will probably have to reset your password the first time you log in. (Click on "Forgotten your username or password?" and follow the onscreen instructions.) This is because

the password to get directly into Moodle is different from your PrideNET password. Our Moodle course webpage is where you can find the syllabus and other handouts during the semester. Office hours, homework assignment details, and helpful links will also be posted on Moodle. I will use Moodle to occasionally post important messages, homework hints, and other course-related information. So you should visit Moodle on a daily basis.

### **HOMEWORK:**

There will be a homework assignment for every (or almost every) section we cover from the textbook. Most of the exercises will be odd numbered, so their answers will be in the back of the book. When working on an exercise, do NOT look at the answer right away! Try to solve it yourself first. This will be the best way to prepare yourself for the environment of an in-class quiz or exam (where you won't have the luxury of "looking in the back of the book"). A handful of exercises will be even numbered, and I will post the answers (and the worked-out steps, time permitting) to these exercises after that assignment's due date. So please hand in homework on time! Once the answers to the even numbered exercises have been posted, submissions for that homework assignment will no longer be accepted. For assignments to be handed in, you must show all of your work for each problem, not just the answers.

**NOTE:** *New England winters can be severe! If the College should cancel classes due to inclement weather, any exam or quiz scheduled on that day will be administered at the next class meeting. Check for class cancellations by calling the school closing information line at 748-5999, or by referring to the SC CableTV station, or by checking announcements aired on radio stations WHYN, WAQY, WTTT, WNNZ, WHMP, and WMAS or television stations Channel 22 and Channel 40.*

### **MyMathLab:**

To help you study at home, we will use MyMathLab. This is an online educational system, which provides a digital version of the textbook as well as interactive study materials. Register and enroll in our MyMathLab course (MATH 310: Linear Algebra) by going to [www.mymathlab.com](http://www.mymathlab.com). Under "Register Now," click on "Student." Before continuing you will need two things:

1. Course ID: **markkanen06753**
2. Access Code: This should have come with your textbook. Check with the bookstore if you do not have an Access Code. There is also an option to buy an Access Code with a credit card online (at a later step in the registration process).

Continue through the registration process by following the onscreen instructions.

You should familiarize yourself with our MyMathLab course. A good place to start is the "Study Plan" and "Quizzes & Tests" sections. Try some of the problems in Section 1.1 in the Study Plan, and attempt the Chapter 1 Pre-Test (which will be difficult at first, because it has material from the entire chapter).

### **MAKE-UP EXAMS:**

Make-up exams are generally not allowed unless you tell me in advance that you will be absent on the exam day. You must also have written documentation for the reason of the absence. For more information, see the make-up exam policy of the Department of Mathematics, Physics, and Computer Science below (in the section titled "Attendance").

## **COURSE WITHDRAWAL**

Students who wish to withdraw from the course must do so through the registrar by the official deadline of **November 21, 2014**. The deadline to withdraw without receiving a grade of withdrawal is **September 15, 2014**.

## **ATTENDANCE:**

*In accordance with the Springfield College Student Handbook:*

“Springfield College students are expected to attend all class sessions for which they are registered; they are also responsible for the material covered in each class session and completion of assigned work by the announced due dates. Instructors are responsible to clearly communicate to the students via the syllabus their policies regarding class attendance and make-up work. Certain situations are recognized as College-excused absences from class, including:

1. Participation in an athletic activity approved by the athletic director and on file in the Dean of Students’ office.
2. Participation in a scheduled curricular or co-curricular activity approved by the appropriate dean or vice president and on file in the Dean of Students’ office.
3. Observation of religious holidays. Instructors should excuse absences of the above nature if the student follows the guidelines listed below. If possible, the instructor should allow the student to make up the class work or complete an alternative assignment. A student who anticipates absences of this nature:
  - Must provide his or her instructors with a list of dates of expected absences by the end of the first week of class and discuss with each instructor the impact of such absences. If the instructor deems that the absences will interfere with the student’s ability to successfully complete the objectives of the course, the student must seek to reduce the absences or withdraw from the course.
  - Should arrange in advance of the absence for make-up of any work that will be missed.
  - Should notify the instructor as soon as possible in the event of a sudden change of schedule (for example, participation in a game rescheduled due to rain or joining a team mid-season) and provide documentation if requested. Again, impact of the absence(s) must be discussed with the instructor.

*Absences due to illness or emergency:*

- In the event of a missed class, students should notify professors as soon as possible and discuss options for obtaining missed material. Contact instructions are available on class syllabi.
- In the event of an absence due to illness or emergency extending longer than two days, students are required to contact the student affairs office at 413.748.3100 in order to notify professors and the residence life staff if necessary.”

In addition, the course in which you are enrolled is subject to the following departmental policy of the Department of Mathematics, Physics, and Computer Science.

- *Students must be prompt. Once the lecture has started, students who enter must do so quietly without disrupting the class. Repetitive tardiness for class will be reported to the Dean of Students.*
- *Unless a student can provide written documentation to justify an absence, more than four unexcused absences will result in a reduction of the student’s letter grade in the course by one full letter grade for every unexcused absence beyond the four unexcused absences.*
- *Make-up exams will be given only to those students who can provide written documentation that justifies the student’s absence at the scheduled time for the exam. If the student is unable to supply written documentation for his/her absence at a scheduled exam, then the student will receive a zero for that exam.*
- If a student misses a quiz for any reason, the student will receive a zero for that quiz. There are no make-ups for missed quizzes.

**Please note: There are no make-ups for missed quizzes. If you miss a quiz, then a grade of zero will be recorded for that quiz.**

**NOTE:** New England winters can come early! If the College should cancel classes due to inclement weather, any quiz/exam scheduled on that day will be administered at the next class meeting. Also, any

assignments or programming projects due on that day will be due at the next class meeting. Check for class cancellations by calling the school closing information line at 748-5999, or by referring to the SC CableTV station, or by checking announcements aired on radio stations WHYN, WAQY, WTTT, WNNZ, WHMP, and WMAS or television stations Channel 22 and Channel 40.

**ACADEMIC ASSISTANCE:** A wide variety of academic assistance is offered through the [Academic Success Center](#). Students can receive a variety of services, such as tutoring through [Writing Support Services](#), [Math-Science Support Services](#) and the [Content Tutorial Program](#). The [Academic Coaching Program](#) is available to help students improve time management and study skills. The [Assistive Technology Program](#) provides training in a range of assistive technology software. The [MTEL Assistance Program](#) provides support for students preparing to take the Communications and Literacy Skills portion of the Massachusetts Tests for Educator Licensure®. The [Conversation Partners Program](#) provides support for non-native speaking students wishing to improve linguistic skills in English, Spanish, French, Chinese, and other languages as available.

The [Academic Success Center](#) is located on the first floor of **Hickory Hall, room 109** and can be contacted at **413-748-3747** or [asc@springfieldcollege.edu](mailto:asc@springfieldcollege.edu). The most up to date information and support service schedules are available on the ASC's PrideNet page:

[https://pridenet.spfldcol.edu/ICS/Academic\\_Departments/Academic\\_Success\\_Center/](https://pridenet.spfldcol.edu/ICS/Academic_Departments/Academic_Success_Center/)

**Accommodation Planning:** If you have a documented physical, learning, or psychological disability on record with the Academic Success Center's [Learning Support Services](#), you may be eligible for reasonable academic accommodations to help you succeed in this course. It is your responsibility to request such accommodation in advance and to provide appropriate documentation. Students on the main campus should contact the **Director of Learning Support Services**, who is located on the first floor of **Hickory Hall, room 105**, and can be contacted at **413-748-3768**. Please let me know of your request as soon as possible so that I can work with you and the Director to arrange for appropriate and reasonable accommodations.

## **INCOMPLETE POLICY**

**“An instructor may give a grade of incomplete (I) following a student’s request in situations where incapacitating illness or exceptional circumstances beyond the control of the student prevent the student from completing course requirements as determined in the sole discretion of the instructor. A student will have a specified period of time, not to exceed one semester exclusive of summer or prior to graduation, to complete incomplete work. A contract for incomplete grades must be completed and signed by both the instructor and the student. The student must complete the incomplete work and a valid grade submitted by the faculty member to the Registrar’s Office no later than the last day of the term subsequent to the term in which the ‘I’ was received. A copy of this contract will remain with the student, the instructor, the registrar, and the academic department (or SHS Campus) offering the course. If the student does not meet the conditions of the contract for the completion of the incomplete by the time specified or prior to graduation, the registrar will automatically change the ‘I’ grade to an ‘F’ grade or an alternate grade designated by the instructor that is based on work completed. This policy applies to all students enrolled at Springfield College effective Fall 1999; it does not affect ‘I’ grades issued prior to this date.”**

## **DECORUM**

As adults, students are expected to exercise proper decorum at all times. Students who are disruptive and disorderly will be requested to leave the classroom and will be reported to the Office of the Dean of Student Affairs.

## **ACADEMIC INTEGRITY AND HONESTY:**

Students are expected to exercise academic integrity and honesty. In the completion of all assignments, exams, quizzes, and laboratory reports, students are to do their own work! Students who are caught cheating or committing plagiarism on assignments, exams, quizzes, and laboratory

reports will be reported to the Dean of Students Office for further possible disciplinary action. Students should refer to the section, “ACADEMIC HONESTY AND INTEGRITY POLICY,” in the Student Handbook under “Academic Policies and Procedures” regarding details of the College’s policy.

**SYLLABUS MODIFICATIONS:**

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the professor reserves the right to modify, supplement, and make changes as the course needs arise.

**COURSE OUTLINE:** (See the next page.)

## COURSE OUTLINE

Please note that there are no classes on Columbus Day, October 13 AND no classes until 4:00 PM on “Humanics In Action Day,” September 23.

We will have approximately 5 quizzes. Quiz dates will be announced at least a week ahead of time, in class and on Moodle.

Week #	Dates	Sections	Topics	Comments
1	9/2-9/5	1.1, 1.2	Systems of Linear Equations, Row Reduction and Echelon Forms	
2	9/8-9/12	1.3, 1.4, 1.5	Vector Equations, The Matrix Equation $Ax=b$ , Solution Sets of Linear Systems	
3	9/15-9/19	1.7, 1.8	Linear Independence, Introduction to Linear Transformations	<i>Quiz in Week 3</i>
4	9/22-9/26	1.9, 2.1	The Matrix of a Linear Transformation, Matrix Operations	
5	9/29-10/3	2.2	The Inverse of a Matrix	<b>Exam 1 is on Wednesday 10/1.</b>
6	10/6-10/10	2.3, 3.1, 3.2	Characterizations of Invertible Matrices, Introduction to Determinants, Properties of Determinants	
7	10/13-10/17	3.3, 4.1	Cramer’s Rule, Volume, <del>and Linear Transformations</del> , Vector Spaces and Subspaces	<i>Quiz in Week 7;</i> Mon. 10/13 is Columbus Day - No Classes.
8	10/20-10/24	4.2	Null Spaces, Column Spaces, <del>and Linear Transformations</del>	
9	10/27-10/31	<i>Review</i>		<b>Exam 2 is on Friday 10/31.</b>
10	11/3-11/7	4.3, 4.4	Linearly Independent Sets; Bases, Coordinate Systems	<i>Quiz in Week 10</i>
11	11/10-11/14	4.5, 4.6	The Dimension of a Vector Space, Rank	<i>Quiz in Week 11</i>
12	11/17-11/21	4.7, 5.1	Change of Basis, Eigenvectors and Eigenvalues	<i>Quiz in Week 12</i>
13	11/24-11/28	5.2	The Characteristic Equation	Wed. 11/26 – Fri. 11/28 is Thanksgiving Break - No Class.
14	12/1-12/5	5.3	Diagonalization	<b>Exam 3 is on Friday 12/5.</b>
15	12/8-12/12	6.1, 6.2, 6.4	Inner Product, Length, and Orthogonality, Orthogonal Sets, The Gram-Schmidt Process	Fri. 12/12 is the last day of classes.

### Final Exam Date and Time:

Wed. 12/17 12:30 p.m.

(I will give you proper notice if any of the dates or times on this course outline get changed.)