

**Math 240 (Linear Algebra – 5 Credits)**  
Daily 1:00 to 1:50 PM, Section AA, Spring 2009  
Item 5819, IVC 108

**Instructor:** David Nelson  
**Office:** SMT 329  
**Office Hours:** Daily 10:00 AM - 10:50 AM, or by appointment  
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**STUDENTS SUBJECT TO PROVISIONS OF AMERICANS WITH DISABILITIES ACT:** If you believe you qualify for course adaptations or special accommodations under the Americans With Disabilities Act, it is your responsibility to contact the Disability Support Services Coordinator, in the LSC and provide the appropriate documentation. If you have already documented a disability or other condition which would qualify you for special accommodations, or if you have emergency medical information or special needs I should know about, please notify me during the first week of class. My contact information is listed above. If you use an alternative medium for communicating, let me know in advance of the meeting (at least one week) so that appropriate accommodations can be arranged. Disability Support Services is located in LSC 126 and may be contacted at: (253)833-9111 x 2631 or TDD at (253) 288-3359.

**Text:** *Linear Algebra*, by Fraleigh Bearegard, 3<sup>rd</sup> Edition.

**Calculator:** A graphing calculator will be required. While any brand of graphing calculator can be used, I will be using a TI-83 in my demonstrations. Using a TI-83 or TI-84 will make it easiest to follow along. The Math Learning Center has a limited number of calculators available for rent.

**Course Description:** Study of systems of linear equations, vector spaces, matrices and matrix equations, eigenvalues and eigenvectors, linear transformations, and applications. Graphing calculator required.

**Prerequisite:** Math 124 with a grade of 2.0 or higher, or instructor's permission.

**Instructional Method:** I typically use a combination of lecture and small group activities to help students acquire a knowledge base, refine skills, and develop concepts.

**Outline:** We will tentatively cover the following sections:

- Test A: Chapter 1
- Test B: Chapter 2 and 3
- Test C: Chapter 4
- Final Exam: Chapter 5 and 6, and all previous material.

**Course Learning Objectives:** By the end of the quarter, the student should be able to:

1. solve and to describe the solution set of a system of  $m$  equations with  $n$  unknowns.
2. write a system of linear equations as a single matrix equation.
3. solve homogeneous and non-homogeneous systems of linear equations using matrix techniques.
4. know the definition of vector space.
5. know the definition of and be able to determine the linear dependence or independence of a set of vectors.

6. know the definition of, and be able to find, a basis for a vector space.
7. know the definition of, and be able to find:
  - a. the length of a vector.
  - b. the dot (scalar) product of two vectors.
  - c. the projection of one vector onto, or orthogonal to, another vector.
  - d. orthogonal or orthonormal vectors.
8. normalize a set of vectors.
9. know the definition of, and be able to identify, a linear transformation.
10. find the inverse of an invertible square matrix.
11. know the definition of, and be able to construct, a matrix similar to a given matrix.
12. find eigenvalues and eigenvectors of a matrix.
13. find a diagonal matrix similar to a given matrix, if it exists.
14. calculate powers of matrices using diagonal matrices.

**CAMPUS-WIDE OUTCOMES:** Green River Community College has identified ability areas that we believe encompass knowledge and are the most important skills, behaviors, attitudes, and values that students will need in order to be successful after leaving the college. Among these ability areas, this class will address Responsibility, Quantitative/Symbolic Reasoning, Critical Thinking, and Written & Oral Communications. Outcomes in these ability areas will be assessed throughout the quarter.

**EXPECTATIONS:** I expect you to participate fully in the class and in your own learning. Collaborative learning in all its forms (group homework, study groups, etc.) is expected. You are not in this alone. I expect you to be in class and to complete all assignments. All assignments are due at the beginning of class. Any work handed in late will be subject to at least a 10% penalty.

A few other points:

- \* Respect for all others in this class is a necessity.
- \* There is no such thing as a dumb question!!
- \* Work sessions outside of class between classmates is highly encouraged.
- \* Do not hesitate to ask me for suggestions or to inquire about your progress in the class.
- \* Absolutely no cheating or plagiarism will be tolerated in this class.

**ASSESSMENT:** Point distribution for participation, homework, and projects will be discussed in class. Short answer problems on quizzes, tests, and the final exam will be assessed as follows:

<u>Points</u>	<u>Work</u>
0	No attempt
1	Restating the problem, drawing a picture, etc.
2	Some correct ideas
3	Half correct ideas
4	Mostly correct ideas
5	Perfection

**Tests:** There will be 3 tests during the quarter and a cumulative final exam. The exact dates of these will be announced in class. The final exam will be Friday, June 2<sup>nd</sup> from 1 PM to 3 PM. If you must miss a test, please let me know as soon as possible. You may be allowed to take a make-up exam, but you will be subject to a 10% penalty regardless of the reason.

**Projects:** There will be a project for almost every unit of material we cover. These will be written reports and should look similar to something you would turn into a boss. One or two of these projects may be done in a group. Projects will be due at the beginning of class.

**Homework:** Your homework score is based on two components: problems from the text and in-class assignments.

Required problems from the text are listed later in the syllabus. On days homework is due, I will select 4 or 5 problems from the list and will ask for volunteers to come to the board and answer the questions. You will earn up to 10 points for each problem you do. Points will be awarded for volunteering and being prepared to provide an answer to the questions. I expect every student will make at least 3 trips to the board during the quarter.

In-class assignments: Occasionally we will have in-class assignments or group mini-projects that will count as homework as well. These in-class assignments may be turned in late, but will be subject to at least a 10% penalty.

**Grading:** Each of the regular tests will be worth 10% of your total grade. The final exam will be worth 20% of your grade. Homework will make up 30% of your grade. The projects will be worth 20% of your grade. I will calculate your overall percentage to the nearest whole number. The final decimal grades will be based on the following percentage scale:

Percent	95%	90%	85%	80%	75%	70%	65%	60%	55%
Grade	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0

Percentages falling between these will receive decimals proportionally between them. (For example, an 89% will be a 3.4 and an 88% will be a 3.3.) Percentages above 95% will receive a 4.0, and percentages below 55% will receive a 0.0. This course may be taken Pass/No credit, but you must arrange that with **Enrollment Services** by **May 22**. You will need a 1.0 or higher to get a Pass.

**Attendance:** Attendance is strongly recommended. You will be responsible for all material presented in class, some of which may not be in the text. If you stop attending class and fail to properly withdraw, you will receive a failing grade. The last day to withdraw is **May 22**.

### FREE SECRETS TO MATH SUCCESS

#### I. Teachers' office hours

Teachers are contractually obligated to have to be in their office at specific times to help students, if office hours conflict w/ your schedule, most instructors will make appointments at other times.

#### II. Math Learning Center - SMT 355

The MLC is a great place to get together with other students and study. They should have additional textbooks, and may have tutors, although 240 tutors are often hard to find.

#### III. *Student's Solutions Manual and Study Guide*.

Available through the bookstore, this book contains worked out solutions to many of the odd problems in the text, a listing of key concepts for each section and some guided examples.

#### IV. Attend Class every day.

Although attendance doesn't directly influence your grade, there is a strong correlation between attendance and success in mathematics.

#### V. Do your homework.

To be able to do anything well, you must practice. I have selected a list of problems that will be similar to exam questions. If you have any difficulty completing these problems, try some other problems in the same section to get more practice. You can always check your answers in the back of the book.

#### VI. Form a study group.

Exchange phone numbers with some others in our class or set a time to get together and study. This is a great opportunity to make new friends and a quick source of help if you ever get stuck while working on your own.

## Math 240 Homework Assignments Linear Algebra, Beauregard, 3<sup>rd</sup> Edition

- 1.1: 3, 5, 7, 11, 13, 15, 21, 23, 25, 29, 33, 35
- 1.2: 3, 7, 11, 13, 19, 25, 29, 33, 37, 39
- 1.3: 3, 7, 11, 15, 19, 25, 33, 43
- 1.4: 1, 2, 3, 5, 7, 9, 15, 19, 23, 27, 33, 41, 47, 57
- 1.5: 3, 5, 7, 11, 17, 21, 27, 33
- 1.6: 1, 3, 5, 11, 13, 17, 21, 23, 27, 35
- 1.7: 3, 5, 7, 9, 11, 19, 28, 34

### Test A covering Chapter 1

- 2.1: 7, 9, 13, 19, 23, 27, 31
- 2.2: 3, 7, 9, 11, 23
- 2.3: 1-5, 7, 9, 10, 14, 17, 18, 19, 20, 22, 23, 28, 30, 31
  
- 3.1: 1, 2, 4, 9, 10, 12, 17
- 3.2: 1-4, 11, 13, 15, 17, 18, 22, 24
- 3.3: 3, 5, 7, 13, 21
- 3.4: 2, 3, 5, 6, 8

### Test B covering Chapter 2 and 3

- 4.1: 13, 14, 20, 22, 25, 27, 37, 38
- 4.2: 1, 4, 8, 9, 12, 13, 15-20, 31
- 4.3: 1, 3, 5, 7, 15, 17, 25, 29, 31

### Test C covering Chapter 4

- 5.1: 1, 2, 6, 8, 13, 18, 30
- 5.2: 1, 2, 5, 10, 11, 18
  
- 6.1: 3, 5, 7, 11, 12, 15, 16, 21, 22, 29
- 6.2: 1, 4, 9, 11, 15
- 6.3: 3, 5, 9, 13

Final Exam – Covering Chapter 5 and 6 and all previous material.

### MATH 240 (Nelson) – Fall 2008 Tentative Calendar

	WK	Monday	Tuesday	Wednesday	Thursday	Friday
<b>A P R I L</b>	1	March 30 Introduction 1.1	31 1.2	April 1 1.2  HW 1.1	2 1.3	3 1.3  HW 1.2
	2	6 1.3	7 1.4  HW 1.3	8 1.4	9 1.4  HW 1.4	10 1.5
	3	13 1.5	14 1.6  HW 1.5	15 1.6	16 1.7  HW 1.6	17 Review  HW 1.7
	4	20 Test A	21 Inservice Day No day classes	22 2.1	23 2.1  HW 2.1	24 2.2
<b>M A Y</b>	5	27 2.2	28 2.3  HW 2.2	29 2.3	30 3.1  HW 2.3	May 1 3.1
	6	4 3.2  HW 3.1	5 3.2	6 3.3  HW 3.2	7 3.3	8 3.4  HW 3.3
	7	11 3.4	12 Review  HW 3.4	13 Test B	14 4.1	15 4.1
	8	18 4.2  HW 4.1	19 4.2	20 4.3  HW 4.2	21 Review  HW 4.3	22 Test C
	9	25 Memorial Day No School	26 5.1	27 5.1	28 5.2  HW 5.1	29 5.2
<b>J U N E</b>	10	June 1 6.1  HW 5.2	2 6.1  HW 6.1	3 6.2	4 6.2	5 6.3  HW 6.2
	11	8 6.3	9 Review  HW 6.3	10 Study Day No day classes	11	12 Final Exam  1 PM – 3 PM

\*\*\*This schedule is tentative and subject to changes (announced in class) as needed.\*\*\*