

# Math 160 - Finite Mathematics

## Summer 2005 Course Syllabus

James Jones, Professor of Mathematics  
Mathematics & Sciences Division  
Richland Community College

### Course Meeting Information

Section 01 meets from 12:00 pm to 1:50 pm Mon, Tue, Wed, and Thu in room S137.

### Instructor Information

James Jones, Professor of Mathematics.

Phone: 875-7211, ext 490

Office: C223

Email: [james@richland.edu](mailto:james@richland.edu)

Web: <http://www.richland.edu/james/>

### Office Hours

Office hours are not required during the summer term. Please see me before or after class or make an appointment with me if you need help.

### Text

*Finite Mathematics for Business, Economics, Life Sciences, and Social Sciences*, 10<sup>th</sup> edition. Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen. Copyright 2005, Prentice-Hall Inc. ISBN 0-13-113962-2

### Student Audience

Most students taking Finite Mathematics are business or accounting majors and are planning on taking introductory statistics. Most will transfer to another school.

### Prerequisite

The prerequisite is successful completion of Math 116, College Algebra, equivalent competencies, or the consent of the Dean of Mathematics and Sciences division.

### Course Description

#### MATH 160 - Finite Mathematics

Hours: 4 lecture - 0 lab - 4 credit

Mathematics 160, Finite Mathematics, is an introductory level course covering mathematical ideas needed by students of business management, social science, or biology. The topics include sets and counting, functions, introduction to probability and statistics, interest and annuities, matrix theory, linear systems, and linear programming.

Applicable toward graduation where program structure permits:

- Certificate or Degree - All Certificates, A.A.S., A.L.S., A.A., A.S.
- Group Requirement - Mathematics
- Area of Concentration - Mathematics

## **Illinois Articulation Initiative (IAI)**

The mathematics component of general education focuses on quantitative reasoning to provide a base for developing a quantitatively literate college graduate. Every college graduate should be able to apply simple mathematical methods to the solution of real-world problems. A quantitatively literate college graduate should be able to:

- interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them;
- represent mathematical information symbolically, visually, numerically, and verbally;
- use arithmetic, algebraic, geometric, and statistical methods to solve problems;
- estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results; and
- recognize the limitations of mathematical and statistical models.

Courses accepted in fulfilling the general education mathematics requirement emphasize the development of the student's capability to do mathematical reasoning and problem solving in settings the college graduate may encounter in the future. General education mathematics courses should not lead simply to an appreciation of the place of mathematics in society, nor should they be merely mechanical or computational in character.

To accomplish this purpose, students should have at least one course at the lower-division level that emphasizes the foundations of quantitative literacy and, preferably, a second course that solidifies and deepens this foundation to enable the student to internalize these habits of thought.

*Math 160, Finite Mathematics, satisfies the Illinois Articulation Initiative Definition of a General Education Mathematics Course. It corresponds to M1 906, Finite Mathematics.*

## **General Course Objectives**

While learning Finite Mathematics is certainly one of the goals of this course, it is not the only objective. Upon completion of this course, the student should be able to ...

- demonstrate comprehension and understanding in the topics of the course through symbolic, numeric, and graphic methods
- demonstrate the use of proper mathematical notation
- use technology when appropriate and know the limitations of technology
- work with others towards the completion of a common goal
- use deductive reasoning and critical thinking to solve problems

A detailed topical outline of the content covered in this course is at the end of this syllabus.

## **Type of Instruction**

Lecture, discussion, problem solving, and group work will be used. Students should come to class with a prepared list of questions.

## **Method of Evaluation**

Could include any of the following: problem solving exams, objective exams, essays, written papers, oral presentations, group and individual projects, quizzes, and homework.

## **Grading Policy**

Letter grades will be assigned to final adjusted scores as follows:

- A: 90 - 100%
- B: 80 - 89%
- C: 70 - 79%
- D: 60 - 69%
- F: below 60%

Consideration will be given to such qualities as attendance, class participation, attentiveness, attitude in class, and cooperation to produce the maximum learning situation for everyone.

The instructor will give you a grade sheet so that you can record your scores and keep track of your progress in the course. If you are concerned about your grades, see the instructor.

## **Attendance Policy**

Regular attendance is essential for satisfactory completion of this course. If you have excessive absences, you cannot develop to your fullest potential in the course. Students who, because of excessive absences, cannot complete the course successfully, will be administratively dropped from the class at midterm. If a student stops attending after midterm, it is the student's responsibility to withdraw to avoid an "F". The instructor has the ability to drop students who are not regularly attending at any time during the semester. The safest way to make sure you're not dropped for non-attendance is to continue to attend classes.

The student is responsible for all assignments, changes in assignments, or other verbal information given in the class, whether in attendance or not.

If a student must miss class, a call to the instructor (RCC's phone system has an answering system) is to be made, or an email message sent. When a test is going to be missed, the student should contact the instructor ahead of time if at all possible. Under certain circumstances, arrangements can be made to take the test before the scheduled time. If circumstances arise where arrangements cannot be made ahead of time, the instructor should be notified and a brief explanation of why given by either voice or email. This notification must occur before the next class period begins. At the instructor's discretion, the score on the final exam may be substituted for the missed exam.

## **Calculators**

The [TI-82](#) or TI-83 graphing calculator will be incorporated into the course heavily. Use of this calculator will allow the student to concentrate on the concepts being taught instead of the mechanical steps to solving the problems. It will allow the student to solve more problems in less time, and more difficult problems which would be too time consuming by hand. Calculators may be used to do homework. Calculators may be used on exams and/or quizzes in class unless otherwise announced.

The instructor has written several programs for the TI-82 or TI-83 that will be used in this course. These programs are also available for the TI-84, TI-85, and TI-86 calculators. However, the programs are not available for other Texas Instrument calculators or for any other brand of graphing calculator. It is expected that you will have a suitable calculator and bring it every day to class.

## **Additional Supplies**

The student should have a red pen, ruler, graph paper, stapler, and paper punch. The student is expected to bring calculators and supplies as needed to class. The calculator should be brought daily. There will be a paper punch and stapler in the classroom.

## **Additional Help**

The student is encouraged to seek additional help when the material is not comprehended. Mathematics is a cumulative subject; therefore, getting behind is a very difficult situation for the student. There are several places where you can seek additional help in your classes.

## **Instructor**

I try to make myself as available to the students as I can. My office hours are listed at the beginning of this syllabus, but those are just the times I'm scheduled to be in my office. Grab me and ask me questions if you see me in the hallway. Ask questions before or after class. If I'm in my office and it's not my scheduled office hours, go ahead and stop in.

The instructor should be considered the authoritative source for material related to this class. If a tutor or other student says something that disagrees with the instructor, believe the instructor.

## **Study Groups**

Probably the best thing you can do for outside help is to form a study group with other students in your class. Work with those students and hold them accountable. You will understand things much better if you explain it to someone else and study groups will also keep you focused, involved, and current in the course.

## **Student Learning Center**

The Student Learning Center is located in rooms S116, S117, and S118. There is mathematics tutoring available in room S116. The Student Learning Center and the tutoring is a service that Richland Community College offers you free of charge.

## **Learning Accommodation Services**

There are accommodations available for students who need extended time on tests, note takers, readers, adaptive computer equipment, braille, enlarged print, accessible seating, sign language interpreters, books on tape, taped classroom lectures, writers, or tutoring. If you need one of these services, then you should see Learning Accommodation Services in room C136. If you request an accommodation, you will be required to provide documentation that you need that accommodation.

Some of you will need additional time on tests. There is no need to go to learning accommodation services to request that. If you need additional time, just let me know and in most cases, I'll allow you to continue working past the allotted time. You may need to move to another room as there may be another class coming into your room. If you're unable to finish the test by staying late, it may be possible to start the test earlier to gain additional time. There may be circumstances where extra time is not allowed.

## **Homework**

Homework is crucial to your success in this course. There is a correlation between doing your homework and success in the course. Not only does the homework count towards your grade, but it also prepares you for the tests. Studies show that the average student will need to spend two hours outside of

class for each hour in class. The very fact that you're in Calculus III shows that you're exceptional students, but still plan on allowing time outside of class for doing homework. Do not expect to master the subject without doing homework.

### **Academic Dishonesty**

Each student is expected to be honest in his/her class work or in the submission of information to the College. Richland regards dishonesty in classroom and laboratories, on assignments and examinations, and the submission of false and misleading information to the College as a serious offense.

A student who cheats, plagiarizes, or furnishes false, misleading information to the College is subject to disciplinary action up to and including failure of a class or suspension/expulsion from the College.

### **Non-Discrimination Policy**

Richland Community College policy prohibits discrimination on the basis of race, color, religion, sex, marital or parental status, national origin or ancestry, age, mental or physical disability (except where it is a bonafide occupational qualification), sexual orientation, military status, status as a disabled or Vietnam-era veteran.

### **Electronic Communication Devices**

The Mathematics and Sciences Division prohibits the use of cell phones, pagers, and other non-learning electronic communication equipment within the classroom. All equipment must be turned off to avoid disturbances to the learning environment. If a student uses these devices during an examination, quiz, or any graded activity, the instructor reserves the right to issue no credit for these assignments. The instructor needs to approve any exceptions to this policy.

### **Topical Outline:**

<b>Hours</b>	<b>Topic</b>
7	<b>Finance</b> <ul style="list-style-type: none"><li>● Simple interest</li><li>● Compound interest</li><li>● Future value annuities</li><li>● Present value annuities</li></ul>
11	<b>Systems of Linear Equations and Matrices</b> <ul style="list-style-type: none"><li>● Review of solving systems of linear equations</li><li>● Augmented matrices</li><li>● Gauss-Jordan elimination</li><li>● Equality, addition, subtraction, and multiplication of matrices</li><li>● Inverses of matrices</li><li>● Matrix equations and systems of equations</li><li>● Leontief Input-Output analysis</li></ul>

<b>Hours</b>	<b>Topic</b>
12	<b>Linear Programming</b> <ul style="list-style-type: none"> <li>● Systems of linear inequalities</li> <li>● Geometric approach to linear programming</li> <li>● Geometric approach to the Simplex method</li> <li>● Standard maximization problems using Simplex</li> <li>● Standard minimization problems using the Dual problem</li> <li>● Non-standard maximization and minimization problems</li> </ul>
4	<b>Sets and Counting</b> <ul style="list-style-type: none"> <li>● Sets</li> <li>● Basic counting principles</li> <li>● Permutations, combinations, and distinguishable permutations</li> </ul>
7	<b>Probability</b> <ul style="list-style-type: none"> <li>● Sample spaces, events, and probability</li> <li>● Joint frequency tables, Venn diagrams</li> <li>● Unions, intersections, complements, odds, mutually exclusive events</li> <li>● Conditional probability, intersections, independence</li> <li>● Bayesian type problems</li> <li>● Random variables, probability distributions, expected values</li> <li>● Decision theory: expected value, maximax, maximin, minimax criteria</li> </ul>
4	<b>Data Descriptions and Probability Distributions</b> <ul style="list-style-type: none"> <li>● Bernoulli and binomial experiments</li> <li>● Normal distributions</li> </ul>
6	<b>Two-player, Zero-sum Games</b> <ul style="list-style-type: none"> <li>● Strictly determined games</li> <li>● Mixed strategy games</li> <li>● Geometric approach to <math>2 \times 2</math> games using linear programming</li> <li>● Simplex approach to <math>2 \times 2</math> games using linear programming</li> <li>● Extension of simplex method to <math>m \times n</math> games</li> </ul>
6	<b>Markov Chains</b> <ul style="list-style-type: none"> <li>● Properties of Markov chains</li> <li>● Regular Markov chains</li> <li>● Absorbing Markov chains</li> </ul>