



### MISSION STATEMENT

Felician College is an independent co-educational Catholic/Franciscan College founded and sponsored by the Felician Sisters to educate a diverse population of students within the framework of a liberal arts tradition. Its mission is to provide a full complement of learning experiences, reinforced with strong academic and student development programs designed to bring students to their highest potential and prepare them to meet the challenges of the new century with informed minds and understanding hearts. The enduring purpose of Felician College is to promote a love for learning, a desire for God, self knowledge, service to others, and respect for all creation.

### DIVISION OF ARTS AND SCIENCES MISSION STATEMENT

The mission of the Division of Arts and Sciences is to implement and manifest the Mission of Felician College in the Programs of the Division; the General Education Program, the Developmental Educational Program, and the Core by providing the highest quality of instruction at both the undergraduate and graduate level, encouraging students to develop to their fullest potential, to gain skills for life-long learning, and to produce graduates well-equipped to contribute to society. The division achieves the stated mission by using processes of continual improvement, based upon assessment of student learning at all levels, as well as the assessment of the administrative processes and mechanisms.

### DEPARTMENT OF MATHEMATICAL SCIENCES MISSION STATEMENT

The Department of Mathematical Sciences supports the mission of Felician College by providing the portion of students' educational experiences dealing with quantitative literacy. The Department supports the mission of Felician College to provide a strong academic program by providing rigorous mathematics courses to students in all majors at all levels. The Department supports the mission of the Division of Arts and Sciences by providing a high quality of instruction in mathematics at both the college level and the developmental level. The broad variety of courses offered by the Department of Mathematical Sciences helps bring students to their highest potential by providing theory and practice related to problem solving, logical reasoning, and analytical skills. This will help prepare Felician College students to meet future challenges with informed mathematical minds.

**Course Number:** Math 112 PM/R

**Course Level:** Undergraduate

**Course Title:** Quantitative Reasoning

**Credits:** 3

**Prerequisite:** Math 002 or equivalent

**Corequisite:** None

**Location & Time:** BH 105, Mondays 5:45 – 8:25 PM

**Instructor:** Dr. Elizabeth B. Uptegrove, associate professor

**Email:** [uptegrovec@felician.edu](mailto:uptegrovec@felician.edu)

**Phone:** (201) 559-3195

**Office:** BH room 4 (basement)

**Office Hours:** Mondays 9:50 – 11:05 and 11:25 – 12:40, Fridays 9:50 – 11:05, and by appointment

### COURSE DESCRIPTION

This course examines various aspects of quantitative literacy such as data representation and interpretation, relationships of numbers (number sense), variables and functions, unit analysis, spatial reasoning, uncertainty, probability, and coincidence. Integration of numeracy and literacy skills will be stressed.

### COURSE CORE OBJECTIVES

Math students will demonstrate Critical Reasoning in Problem Solving and Effective Communication in oral presentation of solutions, and they will apply Quantitative and Analytical Skills to the subject matter.

### COURSE OBJECTIVES

The goal of all mathematics courses is for you to learn to think mathematically. To help you reach that goal, specific goals for this course include the following. Upon completion of this course, you will be able to:

- Describe the different kinds of circuits that can be applied to real-life situations.
- Analyze situations requiring circuit, apply the appropriate circuit, and explain why the selected circuit is an appropriate choice.
- Use suitable tools to solve scheduling conflict.
- Explain the advantages and disadvantages of various voting systems and tell why none is without flaws.
- Predict the winner of an election using Condorcet's method and plurality voting.
- Use and explain various methods for equitable property division.
- Determine the optimal strategy for winning two-person conflict games and explain why that strategy is optimal.
- Determine the check digit for various identification numbers.
- Discuss and make use of various identification strategies and explain under what circumstances each is used.
- Create, describe, and use different kinds of tilings.

### TEXT REQUIREMENT

COMAP (2009). *For All Practical Purposes*, 8th edition. W. H. Freeman Company: New York. The book can be purchased at the Felician College bookstore for \$136.50 (new).

### COURSE CONTENT

**Note: This tentative schedule is subject to change at the discretion of the instructor.**

Week	Date	Reading	Topics	Notes
1	1/25	Chapter 1	Euler circuits	
2	2/1	Chapter 2	Hamiltonian circuits	
3	2/8	Chapter 3	Planning and scheduling	
4	2/15		<i>Presidents Day</i>	<i>College Closed</i>
5	2/22	Chapters 9 and 10	Voting and social choice	<b>Test 1</b>
6	3/1	Chapter 11	Weighted voting systems	

7	3/8		<i>Spring Break</i>	<i>College closed</i>
8	3/15	Chapter 13	Game theory: fair division	
9	3/22	Chapter 14	Game theory: apportionment	<b>Test 2</b>
10	3/29	Chapter 15	Game theory: competition	
11	4/5	Chapter 16	Identification numbers and check digits	
12	4/12	Chapter 17	Binary codes	
13	4/19		Cryptography	<b>Test 3</b>
14	4/26	Chapter 19	Tilings	
15	5/3		Review	
16	5/10		<b>Final exam</b>	

### TEACHING/LEARNING STRATEGIES

- Class lectures, demonstrations, and discussions
- Small group work and discussions
- Study and homework groups
- Individual problem solving

### GRADING POLICIES

- There are no extra credit assignments.
- Homework will be assigned every week. It is *your responsibility* to ask for help if you have difficulty with homework and it is *your responsibility* to arrange to make up any work that you miss if you are absent.
- If you miss a test or quiz, you will be eligible for a makeup only if you have a valid written excuse for the absence. Makeup tests and quizzes are generally much harder than the originals.

### GRADING RUBRICS

- Tests, quizzes, and final exam: You will receive full credit for completely correct answers, with work shown. If you show your work, you will be eligible for partial credit.
- Homework: You will receive full credit for homework completed on time. You will receive half credit for homework that is up to one week late. You will receive no credit for homework that is more than one week late. You will receive credit for attempted homework, even if your answer is not correct, if you show work.
- Classwork: Your classwork grade depends on attendance and participation. You receive no classwork credit for unexcused absences. If you have an excused absence, you will receive credit after you have completed all classwork exercises on your own time, within two weeks after the absence. It is *your responsibility* to find out and complete the classwork you missed. If you are in attendance but do not participate in classwork and class discussions, you will receive half credit for the day's class.

Your final grade will be based upon the following:

Homework and classwork	30%
Tests and quizzes	40%
Final exam	30%

Your letter grade in this course is determined as follows:

<b>Numerical Grade</b>	<b>Letter</b>
95-100	A
90-94	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
70-76	C
65-69	D
64 or below	F

### **COURSE POLICIES**

- You should be engaged in mathematical thinking for the entire class period for every class. You should be courteous to your fellow students. Therefore:
  - Please do not carry on side conversations with other students. Inattentiveness and disruptiveness are grounds for dismissal from this class.
  - Please do not use cell phones or any other electronic devices (except calculators) during class. Use of a cell phone, including for text messaging, is grounds for dismissal from this class.
  - Regular *on-time* attendance is expected. Please notify me in advance of any excused absence or lateness. An unexcused late arrival counts as one-half an absence.
- Calculators are permitted in this class (not cell phone calculators). You are not permitted to share calculators during tests or quizzes.
- Honor Code procedures as outlined in the Felician College Catalog will be followed in this course. You are expected to do your own work unless I state that students may work together. Representing the work of someone else as your own work (plagiarism) is a violation of the Honor Code. If I determine that you have violated the Honor Code, you will get no credit for the applicable work, and the violation will be reported to the honor council.
- Refer to the college catalog for college-wide policies.

### **DISCLAIMER**

This syllabus is subject to change according to the needs of the class as deemed appropriate by the instructor. In case of changes, students will be notified in class and in case of a major change, a new syllabus will be distributed.