### MGF 1107  Math for Liberal Arts 2

**Course Description:** This course introduces the student to the concepts of financial mathematics, linear and exponential growth, numbers and number systems, history of mathematics, elementary number theory, voting techniques, and graph theory. (3-hour lecture)

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<th>Course Competency</th>
<th>Learning Outcomes</th>
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| **Competency 1:** The student will demonstrate knowledge of Financial Mathematics by: | • Communication  
• Numbers / Data  
• Critical thinking  
• Information Literacy  
• Social Responsibility |
| 1. Differentiating between simple and compound interest.  
2. Computing the present and future value of lump sums or streams of payments.  
3. Constructing amortization schedules and computing payments on installment loans.  
4. Utilizing the coordinate plane to graph relationships.  
5. Differentiating between linear and exponential growth.  
6. Developing models of population growth using linear and exponential growth concepts. | |
| **Competency 2:** The student will demonstrate knowledge of numbers and number systems by: | • Numbers / Data  
• Critical thinking  
• Information Literacy |
| 1. Describing what a number system is and what its function is.  
2. Describing the evolution of the real number system.  
3. Converting numbers written in one base to another. | |
| **Competency 3:** The student will demonstrate knowledge of the History of Mathematics by: | • Communication  
• Numbers / Data  
• Critical thinking  
• Information Literacy |
**Competency 4:** The student will demonstrate knowledge of Elementary Number Theory by:

1. Applying the properties of the integers and their structure in relation to the prime numbers.
2. Computing the least common multiple and greatest common factor of two numbers using the Euclidean Algorithm.
3. Performing operations with modular arithmetic.

**Course Competency 5:** The student will demonstrate knowledge of Voting Techniques by:

1. Distinguishing between plurality, Borda Count, plurality with elimination and pairwise comparison voting methods.
2. Stating what reasonable criteria a voting method must have.
3. Determining the flaws in a voting method.
4. Determining winning conditions.

**Course Competency 6:** The student will demonstrate knowledge of Graph Theory by:
| 1. Knowing the terminology of graph theory. |
| 2. Using graphs to model relationships of sets of objects. |
| 3. Applying Euler’s Theorem to solve problems. |
| 4. Using Fleary’s Algorithm to find Euler Circuits. |
| 5. Solving routing problems by using graph Eulerization. |