

## **MAT 120 Math Modeling for Liberal Arts**

### **Institutional Student Learning Outcomes (ISLOs)**

This course supports the student development of Critical Thinking , Quantitative Literacy , and Personal and Professional Development  skills.

#### *Institutional Student Learning Outcomes (ISLOs):*

In addition to discipline-associated knowledge acquired at the college as a foundation for continued study and/or practical application, the MCC community has identified six Institutional Student Learning Outcomes, or ISLOs, as the skills and abilities that are essential to our students' learning and development. MCC provides a wide range of curricular and co-curricular learning opportunities for students to develop and practice them and student achievement of these ISLOs are assessed on an ongoing basis to ensure that our graduates are well-prepared for their future academic and career endeavors.

Below are listed the three ISLOs supported in this course, along with course outcomes and examples of learning activities and types of assignments that you can expect to be doing this semester to support the development of each ISLO.

#### **Critical Thinking**

##### ***Course Outcomes***

Students will be able to:

1. Analyze, categorize, and appraise information gathered on financial issues such as loans, credit cards, mortgages, savings and taxes.
2. Differentiate between the variations on majority rule and apply a variety of methods for deciding an election with three or more candidates.
3. Apply and analyze a variety of apportionment methods.
4. Apply the five-step statistical method to collect and analyze data.
5. Identify and interpret graphs of exponential growth and decay.

##### ***Examples of Assignments and Activities that support the development of this ISLO***

During this semester students can expect that they will:

- Present completed calculations or material gathered from research on mathematical concepts as applied to Financial Management, Statistical Analysis, Voting and Apportionment and Exponential Growth and Decay.
- Compare, contrast, and apply appropriate formulas.
- Participate in Problem Based group activities that ask the students open ended questions that they will analyze and discuss in a small group structure.
- Complete a project for which they research information about purchasing a home and a car, create a family budget, and write a report that includes an analysis of all available options and explains decisions that were made.
- Complete a statistical study and write a report based on data collected, organized, and analyzed by students.

 **Quantitative Literacy****Course Outcomes**

Students will be able to:

1. Calculate and interpret the coefficient of correlation and the linear regression equation for a set of data using a graphing calculator.
2. Demonstrate through a problem-based project the synthesis of statistical principles.
3. Solve application problems using growth and decay models such as: compound interest, population growth/decay, Newton's Law of Cooling, etc
4. Demonstrate, through independent research of a topic and a class presentation, the mathematical principles that are integrated in areas such as: Math and Art, Music, Geometry, Networks and Graph Theory, Probability, or Apportionment and Voting.
5. Graphically represent and summarize statistical data

**Examples of Assignments and Activities that support the development of this ISLO**

During this semester students should anticipate that there will be assignments and activities that include:

- Written reports of projects that incorporate a combination of representations such as numerical, symbolic and pictorial modeling.
- Interpretation and application of appropriate formulas and graphic models to help solve problems.
- Utilization of a technology, e.g. graphing calculator, Excel to model and solve problems.
- Group project in which students investigate, analyze, and assemble a family budget.
- Written report/ paper and a class presentation in which students demonstrate through independent research of a topic, the mathematical principles that are integrated in areas such as: Math and Art, Music, Geometry, Networks and Graph Theory, Probability, or Apportionment and Voting.
- Writing assignments that incorporate numerical calculations and analysis that support the student's conclusion.

 **Personal and Professional Development****Course Outcomes**

Students will be able to:

1. Work together with peers in collaborative groups to solve a variety of mathematical problems.
2. Perform self-assessments.
3. Write reflections on group and peer performance.
4. Articulate the basic concepts of financial management using effective, organized, clear, and grammatically correct English and appropriate mathematical terminology.
5. Evaluate the validity of conclusions drawn from a statistical study.
6. Identify and use the appropriate technology for problem solving.

### ***Examples of Assignments and Activities that support the development of this ISLO***

During this semester students can expect that they will:

- Participate in Problem Based group activities that ask the students open ended questions that they will discuss in a small group structure.
- Present completed calculations or materials gathered from research on topics such as Financial Management and Voting and Apportionment.
- Complete assignments using the appropriate technology.
- Research and present independent research on a topic that demonstrates the mathematical principles that are integrated in areas such as: Math and Art, Music, Geometry, Networks and Graph Theory, Probability, Stocks and Bonds, or How the Federal Budget Operates