



# BROWARD COLLEGE COURSE OUTLINE

**LAST REVIEW: 2010-2011**

*(i.e. 2006-2007)*

**NEXT REVIEW: 2015-2016**

*(i.e. 2011-2012)*

**STATUS: A**

*(A, I, D)*

**COURSE TITLE: Mathematics for Liberal Arts I**

**COMMON COURSE NUMBER: MGF 1106**

**CREDIT HOURS: 3**

**CONTACT HOUR BREAKDOWN**

*(Per 16 week term)*

**CLOCK HOURS:**

*(Voc. Course ONLY)*

Lecture: **48**

Lab:

Clinic:

Other:

**PREREQUISITE(S): MAT 1033**

**COREQUISITE(S): None**

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** *(750 characters, maximum)*: This is a general education course which includes the college-level skills not included in the courses MAT0012 Pre Algebra, MAT0024 Elementary Algebra, and MAT1033 Intermediate Algebra. The course will include topics in logic, geometry, set theory, probability, and statistics. This course will also emphasize applications to real world situations and the integration of other disciplines, including, but not limited to, business and the physical sciences. Meets Areas 4 or 5 of the general education requirement. Recommendation of the Mathematics Department or at least a grade of "C" in the prerequisite course is required.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area 5

General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area 4

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area 4

## UNIT TITLES

1. Sets
2. Logic
3. Geometry
4. Systematic Counting and Probability
5. Statistics

\*\*\* Complete the following only if course is seeking general education status \*\*\*

**GENERAL EDUCATION Competencies and Skills \*:**

In the box to the right of the Competency/Skill, enter all specific **student learning outcome** unit numbers, as indicated in the course outline (i.e. 1.1, 2.7, 4.2, 4.0 and 5.12) that apply.

<b>Course must include <u>all</u> of the following:</b>	
<b>1. Read with critical comprehension**</b>	1.6, 2.3, 2.4, 2.6, 2.7, 2.9, 3.4, 3.5, 3.6, 3.7, 4.6, 4.8, 4.9, 4.10, 4.11, 5.4
<b>2. Write clearly and coherently**</b>	1.1, 1.6, 2.2, 2.3, 2.4, 3.4, 3.5, 3.6, 3.7, 4.8, 4.9, 4.10, 4.11, 5.4
<b>3. Demonstrate literacy as appropriate within a given discipline**</b>	Quantitative: 1.0, 2.0, 3.0, 4.0, 5.0
<b>4. Apply problem solving skills or methods to make informed decisions in a variety of contexts**</b>	1.6, 2.6, 2.7, 3.2, 3.5, 3.6, 3.7, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5
<b>Course must include at least <u>one</u> of the following:</b>	
<b>5. Differentiate between ethical and unethical behavior</b>	5.5
<b>6. Demonstrate an understanding of the physical, biological, and social environments and how individual behaviors impact this complex system.</b>	3.4, 3.5, 3.6, 3.7, 5.1, 5.4
<b>7. Demonstrate an understanding of and appreciation for human diversities and commonalities.</b>	
<b>8. Speak and listen effectively.</b>	

*\*General Education Competencies and Skills endorsed by 2010-2011 General Education Task Force*

**\*\*Required Competencies**

**1) Read with critical comprehension.**

The student will be introduced to the basic texts, concepts, vocabulary, and methods necessary for developing an understanding of the discipline and meeting the required benchmarks as stated in the course outline.

**2) Write clearly and coherently.**

The student will demonstrate an understanding and mastery of subject matter in a variety of ways, including writing. Writing activities may include both graded and ungraded essays, short answer quizzes, summaries, reactions, journals, and various other reports.

**3) Demonstrate and apply literacy across all the disciplines (indicate which ones apply).**

- a) **Information literacy** means understanding how to locate needed information, using the appropriate technology for the task, managing and evaluating the extracted information and using it effectively and ethically.
- b) **Technology literacy** is the ability to responsibly and effectively use appropriate technology to access, manage, integrate, or create information, and/or use technology to accomplish a given task.
- c) **Workplace literacy** is having the appropriate knowledge and skills to communicate and work with others effectively and perform job duties, whether it is through the use of computers and/or other technology.
- d) **Cultural literacy** is recognizing, understanding, and appreciating the similarities and differences between one's own culture and the cultures of others through a study of the arts, customs, beliefs, values, and history that define a culture.
- e) **Quantitative literacy** is having the ability to formulate, solve and interpret mathematical/statistical operations and graphical/tabular representations to make informed decisions.
- f) **Scientific literacy** means understanding the methodology and application of the scientific process, the physical and biological worlds, and recognizing that scientific knowledge is continuously updated or revised as new information is discovered.

**g) Environmental literacy** is creating a context within which environmental issues can be viewed, imparting knowledge to enhance one's ability to analyze the issues, make the connections between humans' decisions and actions and the challenges facing the environment, and instilling the desire to sustain the environment through ethical practices in both one's professional and personal lives.

**4. Apply problem-solving skills or methods to make informed decisions in a variety of contexts.**

The student will use acquired skills or methods to recognize, analyze, adapt, and apply critical thinking to solve problems and make informed decisions.

**EVALUATION:**

In the box to the right of the Methods of Assessment, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 4.0, 4.2 and 5.12) that apply.

1. Portfolio	
2. Short essays	
3. Research Papers	
4. Group projects	3.8, 4.12, 5.7
5. Discussions (In class and online)	
6. Multiple Choice tests	1.0, 2.0, 3.0, 4.0, 5.0
7. Presentations	3.8, 4.12, 5.7
8. Service Learning Projects	
9. Quizzes (pop, announced, etc.)	1.0, 2.0, 3.0, 4.0, 5.0
10. Take-home tests	1.0, 2.0, 3.0, 4.0, 5.0
11. Summaries, critiques, and analyses	
12. Reaction papers	
13. Surveys	
14. Performance	
15. Short answer tests	1.0, 2.0, 3.0, 4.0, 5.0
16. Classroom debates and colloquia	
17. Blogs, wikis, web pages	
18. Other (Please explain)	

**UNITS****Unit 1****General Outcome:**

- 1.0 The student shall be able to demonstrate an understanding of sets, their properties, and some of their many uses.**

**Specific Measurable Learning Outcomes:**

Upon successful completion of this unit, the student shall be able to:

- 1.1 Classify and denote sets by lists, by descriptions, or by set-builder notation; and distinguish between equal and equivalent sets.**
- 1.2 Discriminate accurately between correct and incorrect notational usage.**
- 1.3 Identify subsets, proper subsets, and the cardinality of the power set.**
- 1.4 Determine the complement, union, intersection, difference, and Cartesian product of sets**
- 1.5 Demonstrate an understanding of (and apply appropriately to solve problems) the algebraic properties of set operations, including the commutative, associative, and distributive properties and DeMorgan's Laws.**
- 1.6 Use Venn diagrams and cardinal number formulas to determine set relationships, to deduce facts of set inclusion or non-inclusion, to draw logical conclusions from data, and to solve applied word problems.**
- 1.7 Categorize sets according to their cardinality.**

**Unit 2****General Outcome:**

- 2.0 The student shall be able to demonstrate an understanding of logic concepts and apply the precepts of logic to problems.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 2.1 Recognize, symbolize, and determine the truth values of simple and compound statements.**
- 2.2 Use the truth tables to determine the conditions under which statements (conjunction, disjunction, conditional, biconditional) are true or false.**
- 2.3 Determine the negation of simple and compound statements.**
- 2.4 Write the converse, inverse, and contrapositive of conditional statements.**
- 2.5 Determine if two statements are equivalent or non-equivalent.**
- 2.6 Apply logically valid reasoning techniques to determine when sentential and syllogistic arguments are valid and invalid.**
- 2.7 Use laws of logic to draw valid conclusions.**
- 2.8 Recognize that the validity or non-validity of an argument does not affect the truth of its conclusions.**
- 2.9 Identify fallacies in everyday life (e.g., the fallacies of false cause and hasty generalization).**

**Unit 3**

**General Outcome:**

- 3.0 The student shall be able to demonstrate knowledge of plane and solid geometry, and identify and apply geometric principles to solve problems with the aid of a calculator or statistical software.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1 Identify points, lines, rays, line segments, angles, planes and classify angles.**
- 3.2 Demonstrate knowledge of the basic properties of a circle (area, circumference), and use degree and radian measures of angles to solve problems.**
- 3.3 Classify pairs of lines as parallel, skewed, intersecting, or perpendicular.**
- 3.4 Classify plane figures (triangles, polygons, common curves), and recognize and use their properties to solve problems. Use the Pythagorean Theorem to solve right triangle problems.**
- 3.5 Classify pairs of triangles as congruent or similar, and use these concepts to solve problems.**
- 3.6 Use simple right triangle trigonometric ratios to solve problems.**
- 3.7 Apply the concepts of perimeter, area, and volume to solve problems.**
- 3.8\* Research and locate geometric theorems and principles that can be used to solve problems.**

**\*Optional learning outcome at the discretion of the instructor.**

**Unit 4**

**General Outcome:**

- 4.0 The student shall be able to understand counting techniques and apply methods for computing probabilities.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1 List and count by using systematic methods (product tables, tree diagrams).**
- 4.2 Apply the Fundamental Counting Principle.**
- 4.3 Apply the Factorial Formula.**
- 4.4 Recognize the difference between a permutation and a combination.**
- 4.5 Use permutations and combinations to solve counting problems.**
- 4.6 Apply counting techniques to real world problems.**
- 4.7 Demonstrate an understanding of the development of probability as a mathematical theory, and the historical development of numbers and counting methods.**
- 4.8 Recognize a probability experiment and list the sample space (possible outcomes) associated with such an experiment.**
- 4.9 Determine the probability of a specific outcome in an experiment using simple, compound, and conditional probabilities.**
- 4.10 Calculate the empirical probabilities based on the outcome of an experiment.**
- 4.11 Compute odds, and relate odds to probability.**
- 4.12\* Research and locate data on a topic and determine empirical probabilities using the concepts of this course.**

**\*Optional learning outcome at the discretion of the instructor.**

**Unit 5****General Outcome:**

- 5.0 The student shall be able to apply basic statistical principles in various ways with the aid of a calculator or appropriate statistical software.**

**Specific Measurable Learning Outcomes:**

Upon successful completion of this unit, the student shall be able to:

- 5.1 Compute the mean, median, and mode of a data set, and then recognize and interpret the meaning of these measures of central tendency along with their relationship to each other in various types of distributions.**
- 5.2 Demonstrate an understanding of percentiles and quartiles, and interpret the meaning of these measures of position.**
- 5.3 Compute the range, variance, and standard deviation for a set of data, and then interpret the meaning of these measures of dispersion.**
- 5.4 Recognize the normal distribution curve and its properties, and then use these properties to interpret data, make predictions, and solve problems.**
- 5.5 Recognize random and representative sampling techniques and apply an appropriate procedure for selecting a sample from a given population.**
- 5.6\* Recognize and interpret linear correlation and regression in paired data.**
- 5.7\* Research and collect data on a topic and then apply the statistical concepts of the course to analyze and interpret the data.**

**\*Optional learning outcomes at the discretion of the instructor.**