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| **PROFESSOR:** | **PHONE NUMBER:** |
| **OFFICE LOCATION:** | **E-MAIL:** |
| **OFFICE HOURS:** | **SEMESTER:** |

1. **COURSE NUMBER AND TITLE, CATALOG DESCRIPTION, CREDITS:**

**MAC 1106 COMBINED ALGEBRA AND PRE-CALCULUS (5 CREDITS)**

Major topics of this course include: functions and relations including domain and range, operations on functions, inverse functions, polynomial, rational, and other algebraic functions, their properties and graphs; polynomial, absolute value, rational equations and inequalities; exponential and logarithmic functions, their properties and graphs; solving systems of equations and inequalities, matrices, determinants; piecewise-defined functions; conic sections; sequences and series; applications such as curve fitting, modeling, optimization, and exponential and logarithmic growth and decay; mathematical induction; binomial theorem and applications. Credit is not given for both MAC 1106 and MAC 1105, or for both MAC 1106 and MAC 1140. If completed with a grade of “C” or better, this course serves to demonstrate competence for the general education mathematics requirement.

1. **PREREQUISITES FOR THIS COURSE:**

MAT 1033 with a minimum grade of “B,” or appropriate CLM score

**CO-REQUISITES FOR THIS COURSE:**

None

1. **GENERAL COURSE INFORMATION:** Topic Outline.

• Functions and relations including domain and range, operations on functions and inverse functions

• Polynomial, rational and other algebraic functions, their properties and graphs

• Polynomial, absolute value and rational equations and inequalities

• Exponential and logarithmic functions, their properties and graphs

• Solving systems of equations and inequalities

• Matrices and determinants

• Piecewise-defined functions

• Conic sections

• Sequences and series

• Applications such as curve fitting, modeling, optimization, and exponential growth and decay

• Mathematical induction

• The binomial theorem

• Use of a graphing calculator

1. **All courses at Florida SouthWestern State College contribute to the general education program by meeting one or more of the following general education competencies:**

**C**ommunicate clearly in a variety of modes and media.

**R**esearch and examine academic and non-academic information, resources, and evidence.

**E**valuate and utilize mathematical principles, technology, scientific and quantitative data.

**A**nalyze and create individual and collaborative works of art, literature, and performance.

**T**hink critically about questions to yield meaning and value.

**I**nvestigate and engage in the transdisciplinary applications of research, learning, and knowledge.

**V**isualize and engage the world from different historical, social, religious, and cultural approaches.

**E**ngage meanings of active citizenship in one’s community, nation, and the world.

**A.**  **General Education Competencies and Course Outcomes**

1. Listed here are the course outcomes/objectives assessed in this course which play an integral part in contributing to the student’s general education along with the general education competency it supports.

General Education Competency: **Evaluate**

Course Outcomes or Objectives Supporting the General Education Competency Selected:

* Analyze and interpret a function numerically, graphically, and algebraically
* Determine and apply appropriate mathematical and computational methods, models, principles and algorithms in order to solve mathematical problems related to the course topics; interpret and represent results.

**B. Other Course Objectives/Standards**

* Use set builder and interval notation to express the domain and range of a function defined graphically and defined algebraically.
* Evaluate graphically and algebraically defined functions, including piecewise-defined functions.
* Apply appropriate mathematical properties to graph and interpret continuous and piece-wise functions.
* Perform operations on functions, including compositions and difference quotients.
* Evaluate and interpret the slope and y-intercept of a line, both analytically and graphically.
* Interpret slope as a rate of change in real world scenarios.
* Construct the equation of a line using a point and the slope or two points.
* Determine the distance between two points and the midpoint of a line segment.
* Apply the Pythagorean Theorem to real world examples.
* Graph relations and functions and classify which relations are functions.
* Starting with functions represented graphically or in basic algebraic form, use transformation techniques to construct formulas and/or graphs of related functions.
* Determine and defend whether a function is one-to-one, and if so, find its inverse algebraically and/or graphically.
* Determine the complex zeros, real zeros and linear factorization of a polynomial when given either a graphical or symbolic representation.
* Solve polynomial and rational inequalities graphically and algebraically.
* Determine the defining properties of (linear, quadratic, and higher degree) polynomial, rational, radical, absolute value, exponential, and logarithmic functions and use those properties to sketch their graphs.
* Determine the optimum value (maximum or minimum) of a quadratic function.
* Determine appropriate values for logarithmic and exponential expressions.
* Apply properties, algebraic techniques, and technology to solve exponential and logarithmic equations and interpret the solutions.
* Use multiple approaches to solve systems of linear and non-linear equations, and compare and contrast those approaches.
* Graph the solution to systems of inequalities.
* Determine the equation of a conic section given its graph or characteristics of its graph and vice versa.
* Perform matrix operations, evaluate inverses and determinants, and use the results to solve systems of linear equations.
* Analyze sequences and series using patterning, formulas, and/or technology and extend these concepts to the use of mathematical induction and the binomial theorem.
* Use a graphing utility to determine a curve of best fit for given data.
* Analyze, determine, and implement mathematical models required to solve application problems.

1. **DISTRICT-WIDE POLICIES:**

**Programs for Students with Disabilities**

Florida SouthWestern State College, in accordance with the Americans with Disabilities Act and the College’s guiding principles, offers students with documented disabilities programs to equalize access to the educational process. Students needing to request an accommodation in this class due to a disability, or who suspect that their academic performance is affected by a disability should contact the Office of Adaptive Services at the nearest campus. The office locations and telephone numbers for the Office of Adaptive Services at each campus can be found at <http://www.fsw.edu/adaptiveservices>.

**REPORTING TITLE IX VIOLATIONS**

Florida SouthWestern State College, in accordance with Title IX and the Violence Against Women Act, has established a set of procedures for reporting and investigating Title IX violations including sexual misconduct.  Students who need to report an incident or need to receive support regarding an incident should contact the Equity Officer at [equity@fsw.edu](mailto:equity@fsw.edu).  Incoming students are encouraged to participate in the Sexual Violence Prevention training offered online.  Additional information and resources can be found on the College’s website at <http://www.fsw.edu/sexualassault>.

1. **REQUIREMENTS FOR THE STUDENTS:**

List specific course assessments such as class participation, tests, homework assignments, make-up procedures, etc.

1. **ATTENDANCE POLICY:**

The professor’s specific policy concerning absence. (The College policy on attendance is in the Catalog, and defers to the professor.)

1. **GRADING POLICY:**

Include numerical ranges for letter grades; the following is a range commonly used by many faculty:

90 - 100 = A

80 - 89 = B

70 - 79 = C

60 - 69 = D

Below 60 = F

(Note: The “incomplete” grade [“I”] should be given only when unusual circumstances warrant. An “incomplete” is not a substitute for a “D,” “F,” or “W.” Refer to the policy on “incomplete grades.)

1. **REQUIRED COURSE MATERIALS:**

(In correct bibliographic format.)

1. **RESERVED MATERIALS FOR THE COURSE:**

Other special learning resources.

1. **CLASS SCHEDULE:**

This section includes assignments for each class meeting or unit, along with scheduled Library activities and other scheduled support, including scheduled tests.

1. **ANY OTHER INFORMATION OR CLASS PROCEDURES OR POLICIES:**

(Which would be useful to the students in the class.)