Course Description
MA 133. College Algebra 2 (Algebra Module 11). 1 hour credit. Prerequisite: A score at a predetermined level on a placement instrument or MA 125 (or MA 127, MA 128, and MA 129) and MA 132 with a C or better. This course will enable the student to manipulate functions and their graphs, including polynomial, rational, root, and absolute value functions, and solve polynomial equations. This course is part of a three-course college algebra sequence that includes MA 132, MA 133, and MA 134. Completion of all three courses is equivalent to MA 135 College Algebra. The learning outcomes and competencies specified by the Kansas Core Outcomes Project for this course, as approved by the Kansas Board of Regents (Transfers as MAT 1010).

Required Materials
For complete material(s) information, refer to https://bookstore.butlercc.edu

Scientific calculator (TI-30XIIS) provided by the department for the Module Exam.
- It is recommended that students purchase and become familiar with this specific calculator, so they are comfortable using it. However, for the Module Exams, students are required to use the department-provided calculator, instead of their own.

Access to a graphing utility (for example: a smart phone or tablet graphing app, a website, or a hand-held graphing calculator) to be used for homework only.

Butler-Assessed Outcomes
The intention is for the student to be able to
1. Manipulate functions and their graphs.
2. Solve polynomial equations.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills
- Problem solving – Through the process of learning to solve multi-step and real-world application problems, the student will develop not only an understanding of the general concepts involved in problem solving, but also the skills that can be applied to real-life analytical situations.

Communication Skills
- Reception and interpretation of messages – Through the understanding of relevant definitions, the student will develop the ability to translate written questions into an appropriate analytical form.
Technology Skills
- Discipline-specific technology – Through the use of scientific calculators, the student will learn basic skills involved in problem solving with the aid of visual graphs and immediate calculations that apply to mathematics and real-world situations.

Major Summative Assessment Task(s)
These Butler-assessed Outcome(s) and Learning PACT skill(s) will be demonstrated by
1. Completing a departmental modular exam in which the student solves (A skill) relevant mathematical problems, including problems in written form (C skill), using a variety of algebraic and numerical (T skill) calculations.

Skills or Competencies
These actions are essential to achieve the course outcomes:
1. Simplify and manipulate expressions and equations.
2. Use appropriate analytical and graphical methods to solve equations and inequalities.
3. Graph equations by hand and with the assistance of a graphing calculator.
4. Translate problems from text form into an appropriate analytical form.
5. Use a graphing calculator to assist in calculations and graphical analysis.

Learning Units
I. Relations, functions, and their graphs
   A. Relations and functions
   B. Linear and quadratic functions
   C. Other common functions
   D. Transformations of functions
   E. Combinations of functions

II. Polynomial functions
   A. Introduction to polynomial equations and graphs
   B. Polynomial division and the division algorithm
   C. Location of real zeros of polynomials
   D. The Fundamental Theorem of Algebra

Learning Activities
Learning activities will be assigned to assist the student to achieve the intended learning outcome(s) through lecture, instructor-led class discussion, guest speakers, group activities, drills/skill practice, and other activities at the discretion of the instructor. These activities may be either face-to-face or online.

Grade Determination
The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: daily work, quizzes, chapter or unit tests, comprehensive examinations, projects, presentations, class participation, and other methods of evaluation at the discretion of the instructor.