

MTH 103 College Algebra, Sections 070 & 071 (LBC sections)

Course Syllabus, Fall Semester 2019

Instructor: Robert W. Bell **Office Hours:** Fridays, 11:30 a.m. until 1:30 p.m. in W32 Holmes Hall
Additional office hours by appointment. Please send an e-mail to bellro@msu.edu.

Undergraduate Learning Assistants (ULAs): Taylor Collier (colli746) and Caleb Rispler (risplerc). Taylor will assist on Mondays and Wednesdays in section 070; Caleb will assist on Mondays and Wednesdays in Section 071.

Lectures & Recitations: This class will meet on Mondays, Wednesdays, and Fridays in C-104 Holmes Hall. Section 070 meets 10:20-11:10 a.m. Section 071 meets 1:50-2:40 p.m. **There are no meetings on Tuesdays or Thursdays.**

Required Textbook: None. All of the course materials are on D2L or will be provided as a handout in class. If you are absent, you should obtain these materials from one of your teammates (see below).

Desire To Learn (D2L): Navigate to d2l.msu.edu to **find course materials under the “Content” tab**. The course is subdivided in to 5 “Units.” Each unit is broken down in to several “Lessons.” And within each Lesson, you will see three types of course materials:

- **“Learn It,”** consisting of **notes to be read outside of class** on each course objective.
- **“Practice It,”** consisting of links to **exercises for practice and solutions** to check your work.
- **“Check Your Understanding,”** consisting of materials for review **after you have completed all of the relevant WeBWork** (online homework) exercises.

Calculators: A graphing calculator is required for this course, and you are expected to bring one with you to each class. Calculators with a computer algebra system are not allowed. Cell phones, tablets, laptops, and other wireless capable devices are not permitted as a substitute. The recommended calculators are the TI83+, TI84, or TI84+. You are responsible for being familiar with how to operate your own calculator. That said, the instructor and ULA will help with gaining proficiency.

WeBWork: Graded homework is completed online using WeBWork (math.msu.edu/webwork), an online homework platform managed by the Mathematics Department. See below for due dates for WeBWork assignments. You are required to pay a fee of \$70 to use WeBWork; payment info, etc. is found on the website. **The WeBWork fee is due before September 24.** You can use WeBWork free of charge until this date. It is recommended that you do not pay this fee until you are certain you will remain in the course, as the fee is non-refundable once paid. **WeBWork exercises should be attempted after reading the Learn It content and after attempting some of the Practice It exercises.** You are welcome to and encouraged to work on WeBWork problems with your teammates.

Grading: Grades in these sections will be based on your scores from WeBWork, quizzes, three mid-term exams, a final exam, and teamwork. These will be weighted accordingly:

10% WeBWork, 10% Quizzes, 15% for each mid-term exam, 30% for the final exam, 5% for teamwork.

Final Grade: MSU uses a 4-point system for assigning final grades. The following percentages are the minimum required the corresponding 4-point system grade:

90%: 4.0, 85%: 3.5, 79%: 3.0, 73%: 2.5, 65%: 2.0, 60%: 1.5, 55%: 1.0.

A percentage score of less than 55% translates to a final grade of 0.0. A grade of 1.0 is passing and credit will be awarded. However, undergraduates must attain a minimum cumulative grade point average of 2.0 to graduate from the university.

Homework: WeBWork homework will be completed online at math.msu.edu/webwork. Deadlines for assignments are posted there and also in this syllabus. Correct answers submitted up to 48 hours after the deadline receive 75% credit. For example, if 9 questions are answered correctly by the deadline, but the last question is not correctly solved until shortly after the deadline, then the student receives a score of 9.75 points (out of 10). Make-ups are not permitted. No assignments are dropped. Extensions can be granted for a valid reason; see the exceptions below.

Quizzes: There will be eight quizzes during Friday classes. The lowest quiz score is dropped. There are no make-up quizzes; for exceptions, see below. Quizzes are completed without notes or other materials with the exception of a calculator as per the calculator policy above.

Exams: The **mid-term exams are on Tuesday evenings at 7:30 p.m.** (see below for the schedule) and last 50 minutes. The final exam lasts 2 hours and will be in a classroom that will be announced by the Mathematics Department during the first week of December. **The final exam is cumulative and is scheduled for Monday, December 9 from 10 a.m. until noon.** Exams are completed without notes or other materials with the exception of a calculator as per the calculator policy above. There are no make-up exams; for exceptions, see below.

Teamwork: Students will be sorted into cooperative learning groups, hereafter referred to as “teams,” by the end of the second week. A teamwork score will be assigned to each team at the end of every week, starting with week two. Thus, there will be 14 team scores for the semester. The lowest two will be dropped. Team scores will be either a 0 for unsatisfactory work or a 1 for satisfactory work. In some weeks, your team might complete exceptional work, in which case a score of 2 or 3 may be merited. Each week the teams will be assigned tasks, e.g. meeting outside of class to discuss the readings or working in class to complete a specific task or solve a specific problem. In all cases, the team will craft a written document, and the instructor will use this to assign a team score.

Exceptions to the no extensions or make-ups policies: There may be exceptions when an extension for a WeBWork assignment or a make-up quiz or exam may be permissible. Usually this means that the student will provide advance notice (1 week minimum) that they will be absent for university business or will contact the instructor within 48 hours of an emergency due to illness or other distress. Documentation should be provided whenever possible.

Exception to the exceptions: Make-up final exams must be arranged through the Mathematics Department in advance. Here is the policy:

Make-up Final Exam: Any student having two other final exams scheduled the day of the final exam may take the make-up exam given the next day. If you qualify for the make-up final exam, you must fill out a request at C212 Wells Hall no later than Friday, December 6th at noon and provide a recent copy of your schedule as documentation. You will NOT be allowed to take the make-up final without registering. Students taking the make-up final exam MUST have a picture ID.

MLC & Holmes Math Help Room: The Mathematics Learning Center (MLC) offers free help for MTH 103 students in C126A Wells Hall. For details and hours, see math.msu.edu/mlc/. Additionally, there is a lounge on the 2nd floor of East Holmes Hall, where LBC ULAs hold office hours in a math help room. You are welcome to drop in with questions. Dates and hours will be announced soon.

Honesty: The Department of Mathematics and the Lyman Briggs College adhere to the university policies on academic honesty. Students caught cheating may receive a 0.0 on the assignment/exam or fail the course. Cheating includes using unapproved devices or materials and copying another person's work. For more information visit msu.edu/~ombud/ and honorcode.msu.edu/

Spartan Code of Honor: "As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do." (Written by students for students.)

Important Dates:

Mon, 09/02/2019: Labor Day – University closed

Wed, 09/04/2019: Online open add period for fall semester ends at 8pm.

Thu, 09/05/2019 to Wednesday 09/11/2019: Meet with an LBC advisor if you need to change sections or drop to a lower level course, e.g. MTH 103A.

Wed, 09/11/2019: Last day to late add a course, change section, or drop to a lower course.

Mon, 09/23/2019: Last day to drop with tuition Refund (drop must be before 8pm)

Tuesday, 09/24/2019: WeBWork payment due by 10:00 a.m.

Wed, 10/16/2019: Middle of Semester. Last day to drop a course without a grade being reported.

Thu, 11/28/2019 to Friday 11/29/2019: Thanksgiving Break. **Note: There is class on Wed. 11/27/2019.**

Fri, 12/06/2019: Last day of classes.

Mon, 12/09/2019: Final Exam, 10 a.m. until noon. Location will be announced.

WeBWork Due Dates (all assignments due at 7:00 a.m.)

Schedule of Objectives, Quizzes, and Exams:

Week 1 – August 28 and 30: A1–A3

Week 2 –September 4 and 5: A4–6; Quiz 1

Week 3–September 9, 11, and 13: A7, B1–B2; Quiz 2

Week 4–September 16, 18, and 20: B3–B5; Quiz 3

Week 5–September 23, 25, and 27: B6–B7

Week 6–September 30 and October 2 and 4: C1–2; Exam 1 on Tuesday, Oct. 1 @ 7:30 p.m.

Week 7–October 7, 9, and 11: C3–C4; Quiz 4

Week 8–October 14, 16, and 18: C5–6; Quiz 5

Week 9–October 21, 23, and 25: D1–2;

Week 10–October 28 and 30 and November 1: D3–4; Exam 2 on Tuesday, Oct. 29 @ 7:30 p.m.

Week 11–November 4, 6, and 8: D5–6; Quiz 6

Week 12–November 11, 13, and 15: E1–2; Quiz 7

Week 13–November 18, 20, and 22: E3–4; Quiz 8

Week 14–November 25 and 27: E5–6

Week 15—December 2, 4, and 6: E7; Exam 3 on December 3 @ 7:30 p.m.

Mid-term Exam Dates (please mark your calendars):

Mid-Term Exam 1: Tuesday, October 1 @ 7:30 p.m., location TBD; Topics: A1—A7, B1—B7

Mid-Term Exam 2: Tuesday, October 29 @ 7:30 p.m., location TBD; Topics: C1--6

Mid-Term Exam 3: Tuesday, December 3 @ 7:30 p.m., location TBD; Topics: D1—6, E1—6

Course Objectives:

The objectives below frequently refer to the following four representations of a function:

- numerically, e.g. as a table of data
- graphically, e.g. as a plot of points or as a curve
- verbally, e.g. a description of the function using words
- symbolically, e.g. using an equation to relate variables

Unit 1: Introduction to Functions

- A1: Student can determine if a relation is a function, given any of the four representations, and justify their conclusion.
- A2: Given a symbolic or verbal representation of a function, including piecewise functions, student can create a table and graph.
- A3: Student can interpret function notation and find and interpret function values in all four representations.
- A4: Student can identify features of a function given as a table or a graph, including the domain and range, the intercepts, the intervals where the function is increasing/decreasing, and the intervals where the function is positive/negative.
- A5: Student can add, subtract, multiply, and divide functions given in all four representations, and simplify when necessary/possible.
- A6: Student can evaluate and interpret a composition of two or more functions in all four representations.
- A7: Given a numerical, graphical, or symbolic representation of a function, student can determine if the function is invertible, and if so find and evaluate its inverse.

Unit 2: Linear Functions

- B1: Given any of the four representations of a function, student can determine if it is linear and, if so, student can find the slope and intercepts.
- B2: Given one representation of a linear function, student can create or identify the other three.
- B3: Given data or a verbal description, student can find a linear model and use it to solve application problems.
- B4: Given a function in any of the four representations, student can evaluate the average rate of change between two points.
- B5: Student can find a solution, if one exists, to a system of linear equations and use it to solve application problems.

- B6: Given a graphical or symbolic (including piecewise) representation of an absolute value function, student can find the other representations.
- B7: Student can use equation or graph to find solutions to absolute value equations and inequalities.

Unit 3: Exponential and Logarithmic Functions

- C1: Student can use basic properties of exponents to rewrite expressions and solve equations.
- C2: Given any of the four representations of a function, student can determine if the function could be exponential.
- C3: Given one representation of an exponential function, student can create or identify the other three.
- C4: Student can interpret a logarithmic statement and use basic properties of logarithms to rewrite expressions and solve equations.
- C5: Given a logarithmic function, student can identify intercepts, asymptotes, domain/range, and sketch the graph of the function.
- C6: Given data or a verbal description, student can find an exponential model and use it to solve application problems.

Unit 4: Polynomial and Square Root Functions

- D1: Students can perform operations on polynomial expressions, including multiplication, division, and factoring.
- D2: Student can identify the domain, range, x-intercept, y-intercept, axis of symmetry, and vertex of a quadratic function given in any of the four representations.
- D3: Given a graph of, or information about, a quadratic function, student can find an equation for the function.
- D4: Student can use quadratic functions to solve application problems.
- D5: Given information about a polynomial function, student can sketch the graph and/or draw conclusions.
- D6: Student can find domain, range, x-intercepts, y-intercepts and point of origin of a square root function.

Unit 5: Rational Functions

- E1: Student can perform operations on rational functions and solve rational equations.
- E2: Given information about a basic rational function, student can find a symbolic or graphical representation.
- E3: Given a graphical representation of a function, student can find one-sided and two-sided limits.
- E4: Student can identify domain, x-intercepts, y-intercepts, vertical asymptotes, and holes from a graphical or symbolic representation of a rational function.
- E5: Student can find horizontal and slant asymptotes from a graphical or symbolic representation of a rational function.
- E6: Student can use rational functions to solve application problems.
- E7: Student can set up and solve direct and inverse variation application problems.

WeBWork Due Dates (100% credit awarded if correct by 7 a.m. on the indicated date)

Note: For any problems completed within 48 hours of the due date receive 75% credit. For example, if an assignment has 10 problems, you solve 8 by the due date and solve 1 within 48 hours after the due, but you do not solve the remaining problem, then your score is 8.75 (out of a possible 10 points).

Assignment: Due Date

Tutorial: 9/10

A1—4: 9/10

A5—6: 9/14

A7: 9/17

B1—2: 9/21

WeBWork payment due by 10:00 a.m. on 9/24

B3: 9/24

B4—5: 9/28

B6—7: 10/1

C1: 10/5

C2: 10/8

C3: 10/12

C4: 10/19

C5: 10/22

C6: 10/29

D1: 11/2

D2: 11/5

D3: 11/9

D4: 11/12

D5: 11/16

D6: 11/19

E1: 11/23

E2—3: 11/26

E4: 11/30

E5—6: 12/3

E7: 12/7