MTH 103 Course Syllabus

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Office Hours: Mondays 2-3pm and Wednesdays 2-4pm

Textbook: Stewart, Redlin, Watson, Panman, Zimmerman *College Algebra Concepts and Contexts*. Cengage, Boston, MA, 2017. ISBN: 9781337782678.

Calculator: A graphing calculator is required for this course. You are expected to bring your calculator to every class meeting. The recommended calculators are TI83+, TI 84, or TI 84+. You are responsible for developing proficiency with your calculator. **NOTE:** Some calculating devices are inappropriate for this course. Devices which can perform algebraic symbol manipulation ('computer algebra') should not be used for any graded work in this course. Prohibited devices include: cell phones, tablets, laptops, TI89, TI-Nspire CAS, TI92, TI92+, HP49G, HP49G+, HP50G, and Casios algefx2.0 and algefx2.0pls.

WeBWork: Graded homework is completed online using WeBWork. The course fee for WeBWork is $70. Login instructions, payment information, due dates, etc, can be found on the WeBWork website (http://math.msu.edu/webwork). The **Webwork fee is due before February 5th**. Webwork **can be used for free** up to the due date. If you pay the WeBWork fee and later drop the class, the fee will not be refunded. Thus if you are not sure whether you want to stay in the class, we recommend you use WeBWork without paying the fee until close to the due date. More information about WeBWork assignments is below.

D2L Site: The course site is hosted on D2L (https://d2l.msu.edu). This is where course materials, important deadlines, and course announcements will be posted. Additionally, practice materials with solutions will be available on this D2L site for each course objective.

Grading: Grades in this course are based upon the scores from WeBWorK, quizzes, three in-class exams, and a final exam. Assessment will be distributed according to the following percentages.

Assessment	WeBWorK	Quizzes	Exam 1	Exam 2	Exam 3	Final Exam
Total Percentage	12.5%	12.5%	15%	15%	15%	30%

The following grading scale can be used to estimate grades for individual WeBWorK, quizzes, and exams.

GRADE	0.0	1.0	1.5	2.0	2.5	3.0	3.5	4.0
% GRADE	[0, 55)	[55, 60)	[60, 65)	[65, 73)	[73, 79)	[79, 85)	[85, 90)	[90, 100]

Homework: WeBWork homework will be done online at http://math.msu.edu/webwork. Homework deadlines are available on the WeBWork site. Assignments submitted up to 48 hours after the 100% credit deadline will receive 75% of the score received. Make-ups will not be permitted and no assignments will be dropped.

Quizzes: There will be ten quizzes, given in the Friday recitation classes. Each students' lowest two quiz grades will be dropped. For this reason, no excuses are accepted or required for missed quizzes. The two dropped scores will accommodate quizzes missed due to illness or other personal reasons, as well as low quiz scores. **There will be no make-up quizzes**, with the exception of some MSU-related activities. See the instructor ahead of time to see if you qualify for a make-up.

Exams: In-class exams are scheduled for **Friday February 9, Friday March 16,** and **Friday April 20** during recitation. There will be **no make-up exams!** A missed exam will receive a score of 0 unless the absence was approved by the instructor prior to the exam (or after the exam in the case of an emergency). Only extreme situations with official documentation will allow for such an approved absence from an exam. If excused, the score for the missed exam will then be determined from the corresponding exam questions on the final exam.

The cumulative final exam is scheduled for **Tuesday, May 1, 10am – 12pm.** The room locations will be announced in April. Students are expected to take the final exam at the scheduled time -- the university has strict rules for exceptions. In particular, travel plans do not constitute a sufficient excuse for rescheduling the final. If a student has two other final exams on the same day they are eligible to take a make-up final exam on Wednesday, May 2nd. If you qualify for the make-up final exam, you must fill out a request (https://math.msu.edu/Classes/final_exam_rooms.aspx#make-up). You will not be allowed to take the make-up final without registering.

Regrading: If you have any questions regarding the grading of an exam or quiz, your paper must be handed back to the instructor for re-grading at the end of the class period during which you received it.

Once a graded paper has left the classroom, no grading changes will be made.

MLC: The Mathematics Learning Center (MLC) offers free help for Math 103 students. Its main location is C126A Wells Hall; there are additional satellite locations around campus. For more details and hours, visit https://www.math.msu.edu/mlc/.

Help Sessions: Starting the second week of class, each Thursday there will be optional support sessions from 11:30am-12:30pm and from 3-4pm in Wells Hall room C100. These sessions are great for anyone who wants some more time to work on the course material with an instructor or some extra help preparing for quizzes, exams, and homework.

Honesty: The math department adheres 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.

Dates: The following are important dates for Spring 2018:

Jan 8	Classes begin
Jan 12	Online open add period for spring semester ends at 8pm
Jan 15	Martin Luther King Jr. Day – no classes
Jan 15-Jan 19	Students go to Undergraduate office, C212 Wells Hall for Mathematics enrollment changes (Late adds, drop to lower course, section changes).
Feb 2	End of tuition refund period.
Feb 28	Middle of Semester, 8pm - deadline to drop a course without a grade being reported.
Mar 5-9	Spring Break
Apr 27	Last day of classes

COURSE OBJECTIVES:

The objectives below refer to the **four representations of a function**. These four representations are **numerical** (a table of data), **graphical** (the graph of the function), **verbal** (a word description), and **symbolic** (an equation for the function).

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: Student can interpret function notation and find function values in all four representations.
- A3: Given a symbolic or verbal representation of a function, student can create a table and graph.
- A4: Student can identify features of a function given as a graph, including the domain and range, the intercepts, the intervals where the function is increasing/decreasing, the intervals where the function is positive/negative, and whether the function is even, odd, or neither.
- 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 functions 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.
- B2: Given any of the four representations of a linear function, student can identify the slope and intercepts.
- B3: Given one representation of a linear function, student can create or identify the other three.
- B4: Given data or a verbal description, student can find a linear model and use it to answer questions about a situation.
- B5: Student can find a solution, if one exists, to a system of linear equations and use it to answer questions about a situation.
- B6: Given a piecewise linear function graph, student can create the equation. Given an equation for a piecewise defined function, student can sketch the graph.
- B7: Given one representation of an absolute value function numerically, graphically, or symbolically, student can create the other two of these representations.
- B8: Student can write an absolute value function as a piecewise function.
- B9: 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.
- C2: Student can use basic properties of logarithms to rewrite expressions and solve equations.
- C3: Student can convert an exponential statement to logarithmic form and a logarithmic statement to exponential form.
- C4: Given any of the four representations of a function, student can determine if the function could be exponential.
- C5: Given one representation of an exponential function, student can create or identify the other three.
- C6: Given data or a verbal description, student can find an exponential model and use it to answer questions about a situation.
- C7: Given a logarithmic function, student can identify intercepts, asymptotes, domain/range, and sketch the graph of the function.
- C8: Given a logistic model, student can identify the limiting capacity and initial amount, and can draw conclusions about a real-life situation.

UNIT 4: Polynomial and Square Root Functions

- D1: Student can sketch the graph of a factored polynomial.
- D2: Student can identify the x-intercepts of a quadratic function, given in any of the four representations.
- D3: Student can identify the domain, range, y-intercept, axis of symmetry, and vertex of a quadratic function given in any of the four representations.
- D4: Given one representation of a quadratic function, student can create or identify the other three.
- D5: Student can use quadratic functions to solve application problems.
- D6: Student can find the solution set to quadratic inequalities.
- D7: 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 to solve rational equations.
- E2: Student can identify domain, x-intercepts, y-intercepts, asymptotes, and holes from a graphical, numerical, or symbolic representation of a rational function.
- E3: Given an equation of a rational function, student can sketch the graph, including any asymptotes and/or holes.
- E4: Student can use rational functions to solve application problems.
- E5: Student can set up and solve direct and inverse variation application problems.

SCHEDULE OF LECTURES:

DATE:	TOPIC:	TEXTBOOK SECTIONS:	OBJECTIVES:
Jan 8	Function Overview	1.2, 1.4, 1.5	A1, A2
Jan 10	Graphing functions	1.6, 1.7	A3, A4
Jan 12	Recitation		
Jan 15	NO CLASS		
Jan 17	Composition/Operations on Functions	4.6, 6.1	A5, A6
Jan 19	Quiz 1		
Jan 22	Inverse Functions	4.6	A7
Jan 24	Representations of Linear Functions	2.2, 2.3	B1, B2, B3
Jan 26	Quiz 2		
Jan 29	Linear Functions and Applications	2.3, 2.6	B4
Jan 31	Systems of Linear Equations	2.7, 7.1	B5
Feb 2	Quiz 3		
Feb 5	Piecewise and Absolute Value Functions	1.5, 1.6	B6, B7, B8
Feb 7	Absolute Value Functions and Review	1.6	B9
Feb 9	EXAM 1		
Feb 12	Properties of Exponents	A.3, A.4	C1
Feb 14	Properties of Logarithms	4.1, 4.2, 4.5	C2, C3
Feb 16	Quiz 4		
Feb 19	Representations of Exponential Functions	3.1-3.4	C4, C5
Feb 21	Representations of Exponential Functions	3.1-3.4	C5
Feb 23	Quiz 5		
Feb 26	Applications of Exponential Functions	3.1-3.4, 4.4, 4.5	C6
Feb 28	Applications of Exponential Functions	3.1-3.4, 4.4, 4.5	C6
Mar 2	Quiz 6		
Mar 5-9	NO CLASS – SPRING BREAK		
Mar 12	Logarithmic and Logistic Functions	3.3, 4.1	C7, C8
Mar 14	Review		
Mar 16	EXAM 2		
Mar 19	Polynomial Functions	6.3	D1
Mar 21	Representations of Quadratic Functions	5.1-5.4	D2, D3, D4
Mar 23	Quiz 7		
Mar 26	Representations of Quadratic Functions	5.1-5.4	D2, D3, D4
Mar 28	Applications of Quadratic Functions	5.3-5.4	D5, D6
Mar 30	Quiz 8		
Apr 2	Square Root Functions	1.6, 6.2	D7
Apr 4	Operations on Rational Functions	B.3	E1
Apr 6	Quiz 9		
Apr 9	Graphs of Rational Functions	6.6	E2, E3
Apr 11	Graphs of Rational Functions	6.6	E2, E3
Apr 13	Quiz 10		
Apr 16	Applications of Rational Functions	6.6	E4
Apr 18	Review		
Apr 20	EXAM 3		
Apr 23	Direct and Inverse Variation	2.4, 6.5	E5
Apr 25	Review		
Apr 27	Review		