MTH 138 – College Algebra – Spring 2019

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Class meeting time and place: Section 013 – TR 5:00pm to 6:15pm – Math 204

Office Hours: Times are available by appointment

Course description: Mathematical models; solving equations; creating, interpreting, and graphing functions. Particular focus is given to polynomial, exponential, and logarithmic functions. Prerequisites: two years of high school algebra and one year of high school geometry and TSI complete/exempt status in mathematics.

Core Objectives (CO):
1. Critical Thinking [CO 1]: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills [CO 2]: to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. Empirical and Quantitative Skills [CO 3]: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes (SLO):
At the end of MTH 138, a student who has studied and learned the material should be able to:
1. Employ independence of thought and innovation in order to obtain solutions to typical algebraic problems. [CO 1]
2. Create, manipulate, analyze and solve algebraic equations and expressions, especially linear, quadratic, polynomial, rational, exponential and logarithmic expressions. [CO 1,3]
3. Connect graphical properties with those of associated functions or equations, and use these connections to communicate graphical or physical properties in algebraic language. [CO 2,3]
4. Read, interpret, and communicate written mathematics, both in prose and in its graphical or visual forms. [CO 2]
5. Use functions to model and solve real-world problems. [CO 1,3]

This is a general education core curriculum course and no specific program learning outcomes for the major in mathematics are addressed in this course.

Text and Materials:
The required textbook for this course is *Modeling, Functions, and Graphs: Algebra for College Students* by Katherine Yoshiwara. The textbook is free and available online at [https://yoshiwarabooks.org/mfg/](https://yoshiwarabooks.org/mfg/).

Online homework will be required using Webwork at webwork.sfasu.edu. Additional information about Webwork will be provided in class.

You will need a scientific calculator for this class. Graphing calculators may be used, but are not required. Calculators that include a solver such as the TI-89 or TI-Nspire and calculators that have a QWERTY keyboard are not allowed. The calculator function of a cell phone or tablet will not be permitted during tests or quizzes.

Notes/Outlines will be posted on d2l for each section that we cover. You are responsible for printing them and bringing them to class.

Course Requirements:
There will be three exams and a final exam. The final exam is comprehensive and mandatory. Your final exam grade can be used to replace a low or missing exam grade. **Therefore, there will be no make-up exams.** If you miss an exam, your final exam grade will be substituted in place of the missing exam grade.
Please note that the dates for our in-class exams in the calendar below are subject to change. The final is university scheduled and cannot be taken at a different time without permission of the Dean of the College of Sciences and Mathematics.

**Grading Policy:**
Your final grade will be determined as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
<th>Grade Range</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>Daily Average [CO: 1,2,3]</td>
<td>90% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>60%</td>
<td>Tests (3 @ 20% each) [CO: 1,2,3]</td>
<td>80% - 90%</td>
<td>B</td>
</tr>
<tr>
<td>20%</td>
<td>Comprehensive Final Exam [CO: 1,2,3]</td>
<td>70% - 80%</td>
<td>C</td>
</tr>
<tr>
<td>100%</td>
<td>Final Course Grade</td>
<td>60% - 70%</td>
<td>D</td>
</tr>
<tr>
<td>0% – 60%</td>
<td></td>
<td>0% - 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

20% of your grade will be determined by your daily average. This will include in-class activities, worksheets, quizzes, homework assignments, Webwork, etc. **In-class activities, worksheets, and quizzes cannot be made up. Homework and Webwork assignments will not be accepted late.** However, I will drop one or two of the daily grades at the end of the semester.

**Course Calendar:**
The following is a tentaive calendar for MTH 138 for this semester.

<table>
<thead>
<tr>
<th>Tuesday</th>
<th>Thursday</th>
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<tbody>
<tr>
<td>1/21 – 1/25</td>
<td>Syllabus and Intro to Desmos and Webwork</td>
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<tr>
<td></td>
<td>1.1 Linear Models</td>
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<tr>
<td>1/28 – 2/1</td>
<td>1.3 Graphs of Functions</td>
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<td></td>
<td>1.4 Slope and Rate of Change</td>
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<tr>
<td>2/4 – 2/8</td>
<td>2.1 Nonlinear Models</td>
</tr>
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<td></td>
<td>2.2 Some Basic Functions</td>
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<tr>
<td>2/11 – 2/15</td>
<td>Review</td>
</tr>
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<td></td>
<td>Exam 1 – February 14</td>
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<tr>
<td>2/18 – 2/22</td>
<td>2.4 Functions as Mathematical Models</td>
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<td></td>
<td>2.5 The Absolute Value Function</td>
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<tr>
<td>2/25 – 3/1</td>
<td>3.1 Variation</td>
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<tr>
<td></td>
<td>3.2 Integer Exponents</td>
</tr>
<tr>
<td>3/4 – 3/8</td>
<td>4.1 Exponential Growth and Decay</td>
</tr>
<tr>
<td></td>
<td>4.2 Exponential Functions</td>
</tr>
<tr>
<td>3/11 – 3/15</td>
<td>Review</td>
</tr>
<tr>
<td>3/18 – 3/22</td>
<td>Spring Break</td>
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<tr>
<td></td>
<td>4.5 Exponential Models</td>
</tr>
<tr>
<td>4/1 – 4/5</td>
<td>5.2 Logarithmic Functions</td>
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<td></td>
<td>5.3 The Natural Base</td>
</tr>
<tr>
<td>4/8 – 4/12</td>
<td>6.2 Solving Quadratic Equations</td>
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<td></td>
<td>6.3 Graphing Parabolas</td>
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<tr>
<td>4/15 – 4/19</td>
<td>Exam 3 – April 16</td>
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<tr>
<td>4/22 – 4/26</td>
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<tr>
<td></td>
<td>6.4 Problem Solving</td>
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<tr>
<td></td>
<td>7.1 Polynomial Functions</td>
</tr>
<tr>
<td>4/29 – 5/3</td>
<td>7.4 Graphing Rational Functions</td>
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<tr>
<td></td>
<td>7.5 Equations That Include Algebraic Fractions</td>
</tr>
<tr>
<td>5/6 – 5/10</td>
<td>8.2 Systems of Linear Equations in Three Variables</td>
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<tr>
<td>5/13 – 5/17</td>
<td>Final Exam – Section 013 – Tuesday, May 14 – 4:00pm to 6:00pm</td>
</tr>
</tbody>
</table>

**Exam 2 – March 14**

**Holiday**

**Exam 3 – April 16**

**Review**

**Review**

**Review**

**Review**

**Review**
Per SFA policy 5.4, this schedule reflects that there is (1) an amount of student work per credit hour that reasonably approximates not less than one hour of class or direct faculty instruction and two hours of out-of-class student work per week for fifteen weeks over a long semester, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

**Attendance Policy:**
Attendance is expected and recorded for all students. Attendance will not be formally factored into your course grade, however, missing in-class activities, quizzes, etc., could lower your daily average. Also, missing classes will significantly reduce the instruction you receive, and will therefore naturally decrease your semester grade.

You must make a commitment to attend every class, to arrive on time and to stay the entire time. Bring all necessary materials to each class, be attentive to the task at hand, take notes, and be prepared to participate in class discussions. You must make an additional commitment of doing work outside of class - one to two hours every day. Most importantly, ask for help when you need it.

**Additional Help:**
Free tutoring is available from the AARC. They offer Learning Teams, one-on-one tutoring, and the Math Walk-in Table. The hours for the Walk-in Table will be 1pm to 8pm Monday, Tuesday, Wednesday, and Thursday as well as 4pm to 8pm on Sundays. Sign-ups for Learning Teams begin soon. If you need help signing up, the AARC staff (first floor of library, right-hand side) will be happy to assist. You can find more information on the AARC website, [www.sfasu.edu/aarc](http://www.sfasu.edu/aarc).

**General Education Core Curriculum:**
The Texas Higher Education Coordinating Board has identified six core learning objectives: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, Teamwork, Personal Responsibility, and Social Responsibility. SFA is committed to the improvement of its general education core curriculum by regular assessment of student performance on these six objectives.

By enrolling in MTH 138 you are also enrolling in a Core Curriculum Course that fulfills the Empirical and Qualitative Skills requirement. You will see this course on your D2L list.

At one point during the semester, you will receive an assignment that fulfills both the requirements of this course and the needs of Stephen F. Austin State University’s Core Curriculum Assessment Plan with the Texas Higher Education Coordinating Board. When you complete this one assignment, you need to upload the assignment to both your standard course dropbox determined by your Instructor and the “Core Curriculum” dropbox. The Core Curriculum dropbox will be identified by the Objective for which work is being collected. (Examples: Critical Thinking, Teamwork, Social Responsibility Empirical & Quantitative Skills, Personal Responsibility, Communication Skills-Written, Communication Skills-Written & Visual, and Communication Skills-Oral & Visual.) Please note that this only applies to the approved assignment. All other assignments should be submitted according to regular class operations.

When you complete the assignment mentioned above, you will upload the assignment to both the MTH 138 dropbox and the Empirical and Qualitative Skills dropbox.

Please note that this only applies to the specific assignment listed in the matrix below. All other assignments should be submitted according to regular class operations.

If you have any questions, please see your instructor, or contact the Office of Student Learning and Institutional Assessment at (936) 468-1130.
The chart below indicates the core objectives addressed by this course, the assignment(s) that will be used to assess the objectives in this course and uploaded to the D2L Empirical and Qualitative Skills dropbox this semester, and the date the assignment(s) should be uploaded to the D2L Empirical and Qualitative Skills dropbox. Not every assignment will be submitted for core assessment every semester. Your instructor will notify you which assignment(s) must be submitted for assessment in the D2L Empirical and Qualitative Skills dropbox.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in D2L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking Skills</td>
<td>To include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>To include effective development, interpretation and expression of ideas though written, oral, and visual communication.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Empirical and Quantitative Skills</td>
<td>To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.</td>
<td>MTH 138 Exponential/Log Models: Radioactivity</td>
<td>Monday, April 15</td>
</tr>
</tbody>
</table>

**Acceptable Student Behavior:**
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Students with Disabilities:**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Academic Integrity (A-9.1):**
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)
**Withheld Grades Semester Grades Policy (A-54):**
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.
Course description: Topics include mathematical models; solving equations; creating, interpreting and graphing functions. Particular focus is given to polynomial, exponential and logarithmic functions.

Core Objectives (CO):
1. Critical Thinking [CO 1]: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills [CO 2]: to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. Empirical and Quantitative Skills [CO 3]: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Credit hours: 3

The following is an excerpt from SFA Policy 5.4:
The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Course Prerequisites and Corequisites: See general course prerequisites.

General Education Core Curriculum: This course has been selected to be part of SFA’s core curriculum. The Texas Higher Education Coordinating Board has identified six objectives for all core courses: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, Teamwork, Personal Responsibility, and Social Responsibility. SFA is committed to the improvement of its general education core curriculum by regular assessment of student performance on these six objectives. Assessment of these objectives at SFA will be based on student work from all core curriculum courses. This student work will be collected in D2L, the assessment management system selected by SFA to collect student work for core assessment.

The chart below indicates the core objectives identified by SFA to be assessed in this course. The instructor of each section of the course will provide the assignment(s) that will be used to assess the objectives as well as the date(s) by which the assignments must be completed and uploaded in D2L.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in D2L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empirical and Quantitative Skills</td>
<td>To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.</td>
<td>The instructor of each section will determine the assignment for this assessment.</td>
<td>Only assessed in spring of odd years. (See instructor for due date(s).)</td>
</tr>
</tbody>
</table>
Course outline:

- Making Mathematical Models [CO 1, 2, 3]
  - 5%
- Linear Equations, Functions and Models [CO 1, 2, 3]
  - Review of Coordinate Geometry
  - Graphs of Equations
  - Lines and Linear Modeling
  - Systems of Equations
  - 20%
- Quadratic Equations, Functions and Models [CO 1, 2, 3]
  - Graphs of Quadratic Equations
  - Techniques for Solving and Optimizing Quadratic Equations
  - Applications of Quadratic Functions
  - 20%
- Functions [CO 1, 2, 3]
  - Graphs of Functions
  - Algebra of Functions
  - Inverses of Functions
  - Special Functions
  - Polynomial Functions
  - Division of Polynomials and Factorization
  - 20%
- Exponential and Logarithmic Functions and Models [CO 1, 2, 3]
  - Exponential Functions
  - Logarithmic Functions
  - Logarithmic Identities and Equations
  - Exponential Equations and Applications
  - Modeling with Exponential and Logarithmic Functions
  - 20%
- Solving Equations [CO 1, 2, 3]
  - Field Properties: Associativity, Commutativity, Identity, Inverses, Distributivity
  - Review Rules for Exponents
  - Incorporating Exponents and Logarithms in the Order of Operations
  - 10%
- Explicit instruction in Critical Thinking, Communication and Empirical and Quantitative Reasoning is in addition to implicit instruction, modeling and practice that occur daily in the discussion of college algebra. This explicit instruction includes explanation of solving mathematical problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem.
  - 5%

Academic Integrity

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

The penalty for a student found cheating on any part of an assignment, quiz, or exam in this class will range from a grade of zero on the work to a grade of F in the course, and may result in additional, more severe disciplinary measures. A student who allows another to copy his work and the student copying the work are both guilty of cheating. Do your own work. Do not show your completed work to others. Do not allow others to copy your work.

Definition of Academic Dishonesty (SFA policy 4.1):

Academic dishonesty includes both cheating and plagiarism. Cheating includes, but is not limited to:

- using or attempting to use unauthorized materials on any class assignment or exam;
- falsifying or inventing of any information, including citations, on an assignment;
- helping or attempting to help other student(s) in an act of cheating or plagiarism.
Plagiarism is presenting the words or ideas of another person as if they were one’s own. Examples of plagiarism include, but are not limited to:

- submitting an assignment as one’s own work when it is at least partly the work of another person;
- submitting a work that has been purchased or otherwise obtained from the Internet or another source;
- incorporating the words or ideas of an author into one's paper or presentation without giving the author credit.

Withheld Grades Semester Grades (SFA Policy 5.5)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

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Student Learning Outcomes (SLO): At the end of MTH 138, a student who has studied and learned the material should be able to:

1. Employ independence of thought and innovation in order to obtain solutions to typical algebraic problems. [CO 1]
2. Create, manipulate, analyze and solve algebraic equations and expressions, especially linear, quadratic, polynomial, rational, exponential and logarithmic expressions. [CO 1,3]
3. Connect graphical properties with those of associated functions or equations, and use these connections to communicate graphical or physical properties in algebraic language. [CO 2,3]
4. Read, interpret, and communicate written mathematics, both in prose and in its graphical or visual forms. [CO 2]
5. Use functions to model and solve real-world problems. [CO 1,3]

There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.

Date of document: 01/11/2019