MTH 129.002 – Spring 2020
Concepts and Applications

Course Description
Problem-solving and critical-thinking skills applied to the study of a broad range of topics, including number theory, sequences and series, recursion, data analysis, mathematical modeling and algebra, including connections to the grades EC-6 classroom. A more detailed course description is available online.

Course Prerequisites
MTH 127 and MTH 128

Course Time and Meeting Place
Tuesdays and Thursdays, Room 204 Bush Mathematical Sciences Building, 12:30-1:45pm, January 16 – May 8, 2020

Instructor
- Dr. Jane Long, Ph.D., Associate Professor, Department of Mathematics and Statistics
- Office: Bush Mathematical Sciences Building room 318
- TEL: (936) 468-1804
- Email: longjh@sfasu.edu *** preferred method of contact
- Office Hours: Anytime my door is open, by appointment or

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<tr>
<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Monday</td>
<td>11:00am-12:00pm</td>
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<td>Tuesday</td>
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<td>Wednesday</td>
<td>12:00-12:45pm</td>
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<td>Thursday</td>
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<tr>
<td>Friday</td>
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Additional office hours by appointment. The instructor regularly takes appointments. Do not hesitate to request one.

Current Text and Materials:

A four-function calculator (ONLY- no graphing or scientific calculators) will be allowed on exams but is not required.

Course Goals:
- To understand the mathematics essential to successful teaching in the elementary and middle school classroom.
- To acquire a foundation in numeration systems, number theory and properties of the natural numbers, integers, rational, and the real number system; functions and graphs; probability; and patterns.
- To gain skill in problem solving and critical thinking.

Student Learning Outcomes (SLO):
At the end of MTH 129, a student who has studied and learned the material should be able to:
  1. Identify the number sets. [SBEC: I]
  2. Identify and define recursively and explicitly (when possible) arithmetic and geometric sequences. [SBEC: II, V]
  3. Use finite differences to find the closed form rule for sequences defined by a polynomial. [SBEC: II]
  4. Use geometric series to find the rational number representation of a repeating decimal. [SBEC: I, II, V]
  5. Define relations and represent them in a variety of ways. [SBEC: II]
  6. Determine whether a relation satisfies the reflexive, symmetric, and transitive properties. [SBEC: II, V]
  7. Define functions and function properties. [SBEC: II]
  8. Identify the function families. [SBEC: II]
  9. Interpret graphs of functions. [SBEC: II, V]

Program Learning Outcomes
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.
Course Requirements:

- **Three in-class exams**, 75 minutes, covering course content, on the dates listed below
- **Final Exam** taken **Thursday, May 7, 10:45am – 1:15pm**. The final exam is comprehensive
- **Homework** will be collected and graded. Some assignments may be due during Dead Week. Read the homework grading policy available on D2L carefully
- **Exam corrections**, in which you work any exam questions for which you lost credit. Errors should also be classified according to the instructor’s criteria. These assignments will be returned to you for editing until they are completely correct. Credit for this assignment will not be awarded until all errors are completely corrected. These assignments are classified as “homework” and will not alter exam grades
- **Pedagogical assignments** in which we read and respond to articles and/or other materials related to mathematics teaching through in-class discussion, online discussion board posts, or writing assignments
- **Reading the textbook** is essential to the learning process and is expected
- **Attendance and participation in class meetings** are expected
- **Initiative to seek help outside of class**, in the instructor’s office, the AARC, or other means may be necessary in order to be successful
- **D2L/Brightspace access. You will be required to access SFA’s Learning Management Software (at http://d2l.sfasu.edu) periodically to access documents and surveys**
- **Additional assignments** at the instructor’s discretion
- **Late work will NOT be accepted**
- **Homework will not be accepted electronically**
- **There is NO extra credit**

**Course topics and percentage (time spent in class):**

- Real Number System 20%
- Algebraic Thinking 65%
- Standards 15%

**Homework**

Homework will also be assigned from our textbook and turned in at the beginning of the class. Your average is based on your grades from homework from the textbook and any other daily assignments that are assigned for a grade.

*Per SFA policy 5.4, your schedule should reflect 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.*

**Grading and Exams**

There will be three 75-minute exams during the semester and a 2.5 hour comprehensive final exam. Your course grade will be determined as follows:

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<th>Component</th>
<th>Date</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>Class assignments due according to dates provided by instructor</td>
<td>20%</td>
</tr>
<tr>
<td>Exam I</td>
<td>Thursday, February 6</td>
<td>20%</td>
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<tr>
<td>Exam II</td>
<td>Thursday, February 27</td>
<td>20%</td>
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<tr>
<td>Exam III</td>
<td>Thursday, April 9</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>Thursday, May 7, 10:45am – 1:15pm</td>
<td>20%</td>
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Semester numerical scores will be converted into letter grades according to the following method.

<table>
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<tr>
<th>Range of numerical values</th>
<th>Corresponding Letter</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>Greater than or equal to 80 but less than 90</td>
<td>B</td>
</tr>
<tr>
<td>Greater than or equal to 70 but less than 80</td>
<td>C</td>
</tr>
<tr>
<td>Greater than or equal to 60 but less than 70</td>
<td>D</td>
</tr>
<tr>
<td>Less than 60</td>
<td>F</td>
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When we calculate your final grade at the end of the course, we will calculate a score on a 0-100 point scale using the scores that you have obtained during the course, and the grade breakdown given above. Your course grade will then be obtained using this table.

*Cell phone use is not permitted in or out of the classroom during all exams. If you bring your cell phone to the exam venue, please remember to turn it off. Violation of this policy will be considered as academic dishonesty and dealt with accordingly. You will not be permitted to use your cell phone as a calculator.*

**Pedagogical Assignments:**
In this course, you will be expected to complete some short assignments on topics that are in the intersection of mathematical content and mathematics teaching. Although these assignments are short, they will be graded for content, organization, and format. Add your own thoughts, and connect the question to the mathematical content we have covered in class.

**Exam Policy**
Exams are scheduled far in advance, and it is impossible to move the time or date. However, in rare cases where it is impossible for an individual to take the exam at the scheduled time, we will work with you to make other arrangements. Exceptions for taking the exam out of sequence are the following:

1. A medical excuse. Please provide proper documentation according to university rules.
2. A University sponsored event such as an athletic tournament, a play, or a musical performance. Your coach or director must contact us in advance. Athletic practices and rehearsals do not fall into this category.
3. A religious holiday. Please send a short email explaining the situation.
4. Extreme hardship such as a family emergency. Please have the university office of student rights and responsibilities notify us.

The above are the only allowable excuses for taking the exam before the scheduled time. Under no circumstances do we give late exams. Since we can only accommodate a limited number of students taking the exam at an earlier time, please make sure that you fall into one of the above categories before you contact us. If you miss an exam due to illness or a family emergency, you will not be penalized. The missed exam will be replaced with the final exam grade. If you have a conflict with the final exam (other than another exam at the same time), you must contact the Registrar. Only the Registrar can schedule an out-of-sequence final exam.

**The Classroom**
Any questions you ask in class will likely be ones that other students will want answered as well, so get over any hesitation you might have and ask questions as the material is discussed in class. You will not be penalized for doing this, no matter how trivial or simple you think your questions might seem. Remember, the class is being held for you to learn the material, not just to give you a time to copy notes off the board, so be sure to get help when you need it and stay involved in your class. *Please be respectful of your fellow students and your instructor. Cell phone use and texting are not allowed in class. Remember to turn your cell phone off or place it in quiet mode before entering the classroom.*
Attendance Policy
Regular attendance is expected in Math 127. Attendance and Excused Absences Policy can be found at http://www.sfasu.edu/policies/class_attendance_excused_abs.asp

Add/Drop Policy
The Add/Drop Policy can be found at http://www.sfasu.edu/policies/add_drop.asp

Academic Integrity (Policy 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.

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
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.

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.

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.

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 http://www.sfasu.edu/policies/student_conduct_code.asp). 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.

Expected Student Behavior:
- CELL PHONES are not permitted in this class. DO NOT use your cell phone in class. There should be no cell phones in my, or your, sight during class. Using or monitoring a cell phone during class distracts you and keeps you from learning. Phones should be set to silent (not vibrate) mode and put away during class time. You may NOT use your cell phone as a clock or calculator on exams. If the instructor sees you use a cell phone during class, you will be required to read and turn in a written summary of an article on the topic of negative effects of the use of
electronics and multitasking. You will be responsible for finding such an article. **Your next homework assignment will not be accepted without the required article summary;** the late homework policy will still apply.

- I will send e-mail to the entire class during the course. Check your SFA e-mail address or have SFA forward your e-mail to an account you check at least daily.
- Any disrespectful or disruptive behavior – including, but not limited to: sleeping, reading, side discussions, overt disruptions, name calling, harassing behaviors, etc - will result in your dismissal from the class, and may result in a referral to the appropriate university office.
- The instructor reserves the right to amend these rules as necessary throughout the term.

**Acceptable Student Behavior (University Policy)**

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<th>Week</th>
<th>Date</th>
<th>Topic</th>
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| 1    | Thursday 1/16/20 | Course Orientation  
Number Systems                                                                                   |
| 2    | Tuesday 1/21/20 | § 5.2 Making Sense of Decimal Multiplication  
4.6: P. 191 #7; 5.1: p. 204 #13                                                                  |
|      | Thursday 1/23/20 | § 6.1 Interpretations of Division  
6.2 p. 238 #8; 5.4: p. 219 #1  
§ 6.6. Dividing Decimals                                                                                     |
| 3    | Tuesday 1/28/20 | § 16.1 Basic Principles of Probability  
§ 16.2 Counting the Number of Outcomes: Independent Versus Dependent                                 |
|      | Thursday 1/30/20 | § 16.3 Calculating Probabilities in Multistage Experiments  
§ 16.4 Using Fraction Arithmetic to Calculate Probabilities                                               |
| 4    | Tuesday 2/4/20 | § 2.5 Percent                                                                                   |
|      | Thursday 2/6/20 | Exam I – Chapters 1-8  
Number Systems and Operations                                                                         |
| 5    | Tuesday 2/11/20 | § 7.1 Motivating and Defining Ratio and Proportional Relationships                                |
|      | Thursday 2/13/20 | § 7.2 Solving Proportion Problems by Reasoning with Multiplication and Division  
7.1: p 288 #1, 3  
§ 7.3 The Values of a Ratio: Unit Rates and Multipliers                                                     |
| 6    | Tuesday 2/18/20 | § 7.5 Proportional Relationships Versus Inversely Proportional Relationships                     |
|      | Thursday 2/20/20 | § 7.6 Percent Revisited: Percent Increase and Decrease                                           |
| 7    | Tuesday 2/25/20 | § 7.6 Percent Revisited: Percent Increase and Decrease (con’t.)                                   |
|      | Thursday 2/27/20 | Exam 2: Section 2.5 and Chapter 7                                                                |
| 8    | Tuesday 3/3/20 | § 9.1 Numerical Expressions  
Grapes of Math, Greg Tang                                                                              |
|      | Thursday 3/5/20 | § 9.2 Expressions with Variables                                                                  |
|      | Tuesday 3/10/20 | Spring Break                                                                                     |
|      | Thursday 3/12/20 | Spring Break                                                                                     |
| 9    | Tuesday 3/17/20 | § 9.3 Equations                                                                                   |
|      | Thursday 3/19/20 | § 9.4 Solving Algebra Word Problems with Strip Diagrams and with Algebra                          |
| 10   | Tuesday 3/24/20 | Solving Equations One Step/One Property                                                            |
|      | Thursday 3/26/20 | § 9.5 Sequences (Patterns)  
Blockhead: the Life of Fibonacci (Activity provided)                                                      |
| 11   | Tuesday 3/31/20 | § 9.5 Sequences (Arithmetic and Geometric)  
One Grain of Rice                                                                                     |
<p>|      | Thursday 4/2/20 | § 7.4 Proportional Relationships                                                                |</p>
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<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>12</td>
<td>Tuesday 4/7/20</td>
<td>§ 9.6 Functions</td>
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<td>Tuesday 4/14/20</td>
<td>Easter Holiday</td>
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<td></td>
<td>Thursday 4/16/20</td>
<td>§ 9.7 Linear and Other Relationships</td>
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<tr>
<td>14</td>
<td>Tuesday 4/21/20</td>
<td>§ 3.5 Why We Add and Subtract with Negative Numbers the Way We Do</td>
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<td>Thursday 4/23/20</td>
<td>§5.3 Extending Multiplication to Negative Numbers</td>
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<td>15</td>
<td>Tuesday 4/28/20</td>
<td>§ 8.6. Rational and Irrational Numbers</td>
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<td>Thursday 4/30/20</td>
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| 16 | Thursday 5/7/2020 | Final Exam  
10:45am – 1:15pm         |