Course: MATH 0987 – Foundations for Quantitative Reasoning
Semester: Fall 2015
Instructor: Thomas Hartfield
Office: Watkins Academic Building - 120
Office Phone: 678.717.3858
E-Mail: thomas.hartfield@ung.edu
Web Page: http://faculty.ung.edu/thartfield/
Office Hours: Monday & Wednesday 8:15 – 8:45 am, 2:15 – 3:00 pm
Tuesday & Thursday 8:15 – 9:15 am, 1:15 – 3:00 pm
Withdrawal Deadline: Monday, October 12, 2015
Final Exam: Tuesday, December 8, at 10:20 am

Catalog Description: This course integrates numeracy, proportional reasoning, algebraic reasoning and understanding of functions. Students will develop conceptual and procedural tools that support the use of key mathematical concepts in a variety of contexts. This course prepares students requiring Learning Support (or otherwise advised to refresh their mathematical literacy) to take MATH 0997 (Support for Quantitative Reasoning) and Math 1001 (Quantitative Skills and Reasoning). MATH 0987 is not intended to prepare students for MATH 1111. Students needing MATH 1111 are advised to enroll in MATH 0989 or MATH 0999 as placement tests indicate. This is a four hour course with no pre-requisites; ACAE 0099 is a co-requisite if required by placement.

Course Objectives: After completion of the course the student will:
- **NUMERACY GOAL:** Develop and apply the concepts of numeracy to investigate and describe quantitative relationships and solve problems in a variety of contexts. Students will:
  - Demonstrate operation sense and communicate verbally and symbolically the effects of common operations on numbers.
  - Demonstrate competency in using and an understanding of magnitude in the context of place values, fractions, and numbers written in scientific notation.
  - Use estimation skills, knowing how and when to estimate results, solve problems, detect errors, and check accuracy.
  - Apply quantitative reasoning to solve problems involving quantities or rates
  - Demonstrate measurement sense.
  - Demonstrate an understanding of the mathematical properties and uses of different types of mathematical summaries of data, such as, measures of central tendency, and mathematical models.
  - Read, interpret, and make decisions based upon data from graphical displays, such as line graphs, bar graphs, scatterplots, and histograms.
• **PROPORTIONAL REASONING GOAL:** Represent proportional relationships and solve problems that require an understanding of ratios, rates, proportions, and scaling. Students will:
  - Recognize proportional relationships from verbal and numeric representations.
  - Compare proportional relationships represented in different ways.
  - Apply quantitative reasoning strategies to solve real-world problems with proportional relationships based on an understanding that derived quantities may be described with whole numbers, fractions, or decimals, or a combinations of these, and that to fully explain these relationships, units must be used.

• **ALGEBRAIC REASONING GOAL:** Reason using the language and structure of algebra to investigate, represent, and solve problems. Students will:
  - Understand various uses of variables to represent quantities or attributes.
  - Describe the effect that a change in the value of one variable has on the value(s) of other variables in the algebraic relationship.
  - Construct and use equations or inequalities to represent relationships involving one or more unknown or variable quantities to solve problems.

• **FUNCTIONS GOAL:** Represent relationships between quantities in multiple ways and solve problems that require an understanding of functions. Students will:
  - Translate problems from a variety of contexts into a mathematical representation and vice versa. **Representations will include linear, exponential, and an introduction to squaring functions.**
  - Describe the behavior of common types of functions using words, algebraic symbols, graphs, and tables.
  - Identify when a linear model or trend is reasonable for given data; when a linear model does not appear to be reasonable, know how to explore the applicability of other models.
  - Identify important characteristics of functions in various representations.
  - Use appropriate terms and units to describe rate of change.
  - Understand that abstract mathematical models used to characterize real-world scenarios or physical relationships are not always exact and may be subject to error from many sources, including variability.

**Texts & Materials:** Quantway™ I Materials (from Carnegie Foundation)
(These course materials were originally created by The Charles A. Dana Center at The University of Texas at Austin under sponsorship of the Carnegie Foundation for the Advancement of Teaching. The current version and any subsequent versions, result from the continuous improvement efforts of the Carnegie Networked Improvement Community, of which UNG (formerly GSC) is a legacy member.)

   - Access code will be purchased online through XanEdu Publishing Inc. The price for just the code is $88.80. You also have the option of purchasing two workbooks – the In-Class Workbook and the Out-of-Class Workbook. The price for the code plus both workbooks is $115.49. Students will have access to the online platform for the first three weeks of the course for free and then will be blocked from the site until payment is made. The two workbooks will also be provided by the instructor via the online platform. Each student is responsible for printing both workbooks and having them in their notebook and in class.

2. **Additional Materials:**
   - A 3-ring binder with dividers is needed to collect the lessons and the assignments.
   - A scientific calculator
3. Library Resources:

4. Web-based Resources:
   - Texas Instruments - [http://www.education.ti.com](http://www.education.ti.com)

Methods of Instruction: Collaborative discovery and learning is the primary method of instruction for this course. Students are expected to work both individually and in groups to explore mathematics and gain a greater understanding of important skills and concepts. Participation and engagement, careful reading and writing, critical thinking, and problem solving are important elements of MATH 0987. Instructor direction and guidance will be on a limited, as-needed basis to fill in missing information and to clarify uncertainties.

You will interact with other students to improve your mathematical reasoning. You will be assigned to groups and are expected to contribute to the problems your group is working on.

Be prepared, interact, be respectful, and expect to leave the class with more mathematical knowledge.

Evaluation Methods: Formative assessment will be in the form of four written tests supplemented by online homework and daily activities and summative assessment will be in the form of a final examination.

Testing Policy: In class tests must be started before any student completes his/her test. Tests may be taken early under arrangements with the instructor. Make-up tests will not be offered. Students will replace a missed test grade using those questions on the final exam pertaining to an individual module.

Final Grades: The semester average will be determined by the average of eight scores comprised as follows: the four test grades, the online homework average, a notebook and participation average, and the final exam counting twice.

<table>
<thead>
<tr>
<th>100%</th>
<th>90%</th>
<th>80%</th>
<th>70%</th>
<th>60%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>IP or U</td>
<td>F or U</td>
<td></td>
</tr>
</tbody>
</table>

Attendance Policy: Students with greater than six absences during the term, including more than four consecutive unexcused absences at any time, *may* be withdrawn from the class by the instructor in accordance with the UNG policy on excessive absences. Students withdrawn from the class prior to the midpoint may receive either a W or a WF. Students withdrawn from the class after the midpoint will receive a WF.
A student who fails the course will have his/her date of last attendance or assignment completed noted for federal financial aid regulations.

Schedule Changes: The instructor reserves the right to reschedule assignments by up to two class meetings due to unexpected events or adjustments in class pacing. Test postponements may be announced up through the class meeting preceding the scheduled date of test.

Additional Policies:  
1. Each student is allowed a maximum of 2 attempts to complete the Learning Support math class MATH 0987. A grade of "W" will not count as one of those attempts. MATH 0987 is not an exit level course. Students who do not pass MATH 0987 in the second attempt will be placed on Learning Support Dismissal for one (1) year (three consecutive semesters) from all University System of Georgia Schools. A Learning Support Dismissal in MATH 0989 is not appealable.
2. Students enrolled in both Learning Support courses and credit courses may withdraw from said Learning Support courses and remain in their credit courses unless the Learning Support course is considered a co-requirement for remaining in the college-level course. Please refer to your other course syllabi to determine whether or not enrollment in this LS math course is a condition for enrollment in any of your other courses. Students are reminded, however, that Area A math requirements must be satisfied by the time they earn 30 college credits.
3. To exit MATH 0989, students must earn an A, B, or C in the course.
4. If a student makes an A in MATH 0987, the student may take MATH 1001 without the MATH 0997 as a co-requisite.
5. A grade of "IP" is given to the first-time MATH 0989 student whose final average is 60-69. At the discretion of the Instructor, a grade of "IP" may be given to a student whose final average is below 60. A student receiving an "IP" is required to repeat the course.
6. A grade of "U" must be given for an unsuccessful second attempt in MATH 0989. Upon receiving a "U", the student will be suspended from all University System of Georgia institutions for one year.