Mathematical Reasoning 113
Semester: spring 2015
Monday, Wednesday, Friday

Course Description: Classical and modern topics in Problem Solving, Number Theory, Logic, Geometry, Topology, and probability with emphasis on problem solving along with Consumer mathematics and other real-world applications. (QR) 3 credit hours. Math 113 is designed to fulfill general education requirements for students whose majors do not require a specific math class. This course does not support degree-level learning towards a degree in Mathematics.

STUDENT LEARNING OUTCOMES:

- To be able to see the "connections" between math and the world around us
- Develop critical learning skills.
- Understand the history of math and how it relates to our lives today.
- Seeing fractals and other math concepts in engineering, science and medicine.
- Cultivate abilities in reasoning .
- Learn reasoning behind financial mathematics

Instructor's Name:	Wenqiang Feng (Phone)
Section Number:	Section 2 (CRN 20238)
Days & time of class	MWF 8:00 am - 8:50 am
Class location:	HSS 110
Instructor's Office	109 Ayres Hall
Phone:	865-898-6089
Email:	wfeng1@vols.utk.edu (M113 sec 002)

Office Hours

Day	Monday	Tuesday	Wednesday	Thursday	Friday
Time:	**1:00-2:00**		**1:00-2:00**		**1:00-2:00**
Office:	**A109**		**A109**		**A109**

Required Materials
Textbook
Small ruler, about 6 inches
Calculator (no cell-phone calculators)
scissors
On project days bring Scissors and tape or other materials as instructed.

Textbook: The Heart of Mathematics by Burger and Starbird, 4'th edition, Wiley Publishers. **(Electronic Book)**

Student ID: You must have your student ID when taking exams.

Extra Help: The math Tutorial Center provides free tutoring. Location: (Ayres Basement, B012)

Math Tutorial Center
DEPARTMENT OF MATHEMATICS

Free tutoring is provided for all 100 level and most 200 level math courses. Help is available during the day in Ayres Hall room G012 (east basement) and in the evenings in the north commons on the second floor of Hodges library. For specific hours of operation and campus maps go to the MTC webpage: http://www.math.utk.edu/MTC/

Disability Services: If you need extra help due to a disability please contact the office of disability services at 2227 Dunford Hall.
Phone: 974-6087

Student ID: You must have your student ID when taking exams.

Classroom Etiquette: While in the classroom you are expected to behave as adults. Do not come to class late or leave early. Turn off cell phones,
iPods, laptops and beepers during class. Refrain from reading newspapers or other course material during lecture. Do not text message during class. Do not talk at inappropriate times to other students during class lecture .For classroom behavior expectations go to the link:
http://www.math.utk.edu/Undergaduate/undergrad/Expectations.pdf

Final Exam: The comprehensive final Exam is mandatory for all students. If you do not take the final exam, you will receive an "F" in the course

Attendance and Make Up Policy:
Students are expected to attend every class. Borderline grade decisions will be based on attendance, among other factors.
All homework is due on the assigned date. No late homework will be accepted and will not be made up.
Quizzes and projects must completed the next class period or a penalty will result. No quiz or project can be made.
Note: Make-up Tests will be given at the discretion of the instructor. The instructor considers make-up tests a privilege, not a right. The student requesting a make-up test should make a reasonable effort to contact the instructor (preferably by email) within 24 hours of missing the test. Failure to do so may result in a grade of 0 for the missed test. If a make-up test is approved by the instructor, the student will be notified via email. Students requesting a make-up test should be diligent about checking email for a response from the instructor. The content of the make-up test may significantly differ in format from the scheduled test, and the student must complete the make-up test within the time frame indicated by the instructor. Failure to read email in a timely manner is no excuse for missing the approved make-up time frame. The instructor may require verifiable documentation of the illness or emergency or may request that the student obtain verification from the Dean of Students Office (dos@utk.edu, 865-974-3179).

	GRADING		***SCALE***	
	Percentage of Grade		**Grading Scale as a percentage**	**Letter Grade**
Exam # 1	15%		90 - 100%	**A**

Exam # 2	15%		87 - 89%	**A -**
Exam # 3	15%		83 - 87%	**B +**
Exam # 4	15%		80 - 82 %	**B**
			77 - 79 %	**B -**
Projects, Written Work,			73 - 76 %	**C +**
Quizzes, Attendance,	This total = 20%		70 - 72 %	**C**
and Other			67 - 69 %	**C -**
			63 - 66 %	**D +**
Final Exam	**20%**		60 - 62	**D**
			57-59	**D -**
			56 and below	**F**

Please note that the topics on the following pages can be taught in a different order if the topics are not a necessary precursor to the following topic.

Day	***Section***	***TENTATIVE Topic and Homework Problems-dependent on individual instructor.****The most in depth problems are indicated in* ***black bold*** *on this syllabus.* ****Topics with an asterisk are required for Math 113***
1	1.1-1.2	Introduction and problem solving
2	1.2-1.3 Flexible	Problem Solving. Write up 1 to 4 solutions to instructor's selected problem(s) If you want to skip this topic another option is secret codes and spying after 2.4
3	2.1	Counting and the pigeonhole principle. # 1, 2, 3, 5, 8,12,13, 15, **19**
4	***2.2**	Fibonacci numbers. # **1**, **2**, 3, 4, **6**, **7**, **8**, 12,**16**
5	***2.2**	Fibonacci numbers. # **17**, **28, 29, 30, 38, 41, 42,46**
6	***2.3**	Prime Numbers. # **1**, **2**, **3**, **4**, **5**, **7**, 8, 10
7	***2.3**	Prime Numbers. # 12, **14**, 15, 25, 30, **32, 35,40**
8	***2.4**	**Learn addition and multiplication in modular arithmetic, # 1, 6, 7, 8**
9	Review	Review for Exam # 1
10	*	**Test # 1**
11	***2.6**	Irrational Numbers. # 1, 2, 3, **4**, 5, **6**, 8, 10, 12, 13
12	***2.6-2.7**	Irrational and real numbers.Ch. 2.6: # 14, 18, 19, 21, 22, **26, 36**. Ch 2.7: # 1, 2, 3, 4, 5
13	***2.7**	Real Numbers. # 7, **10**, 11, 14, **17**, **20**, **21**, **22**, **23**, **25**, **37, 43**
14	***3.1**	What is infinity? # 1, 2, **3**, 4, **8**, **9**, **14**, 15, **19, 20,22**
15	***3.2**	One to One correspondences. #1, **2**, **3**, 5, **6**, **9**, 10, **13**
16	***3.2-3.3**	One to One. Ch 3.2: # **15**, **29, 38** Different sizes of Infinity Ch 3.3 # **1**, **2**, **3**, **4**, **5**, 9, **10**
17	3.3 Flexible	Different sizes of Infinity. # 11, **13**, 14, **20, 23, 24** OPTIONAL: 3.4 or 3.5 power set and geometric interpretations.
18	Review	Review For Exam # 2
19	*	**Test # 2**
20	***4.1**	Pythagorean Theorem. # **1**, **2**, **3**, **4**, 5, 6, **8**, 12, 14, **15 (ft only)**, 17, **18, 22, 23**
21	4.2	Art Gallery Theorem. # 1, 2, 3, 4, 5, 6, 7, 9
22	4.2-4.3	Art Gallery Theorem, Ch 4.2 # 11, 12, 14,15, **16, 19, 23**, Golden Rectangle Ch 4.3 # 1, 2, 3, 4, 5, 6

23	4.3	Golden rectangle. # 9, 12, 14, **17, 19, 24, 29**
24	4.4	Symmetry and Tilings. # 1, 2, 5, 6, 8, 9, 11
25	4.4	Symmetry and Tilings. # 12,14, **16, 21, 28**
26	Review	Review For Exam # 3
27	*	**Test # 3**
28	***4.5**	Platonic Solids. # **1**, **2**, **3**, 4, **5**, 6, 7, 8, 10, **identify each platonic solid**
29	***4.5**	Platonic Solids. # 14, **16, 21, identify the dual of each platonic solid**
30	***6.2**	Euler Characteristic. # **1**, 2, **3**, 11, **21, 22** or **23, 25, 29, 39, 40**
31	4.6 Flexible	The Shape of Reality. # 1-5, 7, 8, 11, 14, **16, 18, 19**.
32	4.7 Flexible	Fourth Dimension. # 1-5, 7, 8, **16, 19**.
33	5.1 Flexible	Rubber Sheet Geometry. # 1,3, 7, 9, 10, 11, 12, 18, 26, 27, **39, 46**
34	5.2 Flexible	Mobius Band and Klein Bottle. # 1, 2, 3, 4, 8, 9, 13, 25, **26, 30, 34, 39**
➡	**Flexible Options**	**Optional: Include chapters 6.1, 6.2, 6.3, and 6.4 (graphs, coloring) here instead of 4.6, 4.7, 5.1, 5.2 OR** **Other Option: 7.1, 7.2, 7.3, 7.4, 7.6 (Fractals, chaos) here instead of 4.6, 4.7, 5.1, 5.2**
35	Review	Review For Exam # 4
36	*	**Test # 4**
37	8.2 Flexible	Probability. # 1, 2, 3, 4, 5, 6, 7
38	8.2-10.2 Flexible	Probability and Risk. 8.2: # 12, 15, 25, 28, 34, For 10.2: # 1, 2, 3, 4, 6, 10
39	10.2 Flexible	Risk. # 11, 13, 15, **17, 20, 21,**
40	10.3 Flexible	Finance. # 1, 2, 3, 8, 9, 10,
41	10.3 Flexible	Finance. # 12, **16, 17, 18, 19,and 23** , Worksheets
➡	**Flexible Options**	**OPTIONAL: 10.4: voting or 10.5: deciding how to slice up scarce resources.** **Other Option: 7.1, 7.2, 7.3, 7.4, 7.6 (Fractals, chaos) here instead of 8.2, 10.2, 10.3**
42	Review	Review For Final Exam
Date	**Room #**	**Time(s) For Final Exam**
Apr.29	HSS 110	Wed, Apr 29th in HSS110 from 8:00am-10:00am. Missing the Final results in an "F" in the course.

Important Dates	
Classes Begin	January 7
Last day to add, change grading options	January 16
Martin Luther King Day (No classes)	January 19
Spring Break (No classes)	March 16-20
Last Day to drop with a "W"	March 31
Spring Recess	April 3
Classes End	April 24
FINAL EXAM DATE:	April 29 8:00-10:00 am

Academic Standards of Conduct:

All students are expected to abide by the University **Honor Statement**. In mathematics classes, violations of the honor statement include copying another person's work on any graded assignment or test, collaborating on a graded assignment without the instructor's approval, using unauthorized "cheat sheets" or technical devices such as calculators, cell phones or computers for graded tests or assignments, or other infractions listed in "***Hilltopics***".

These violations are serious offenses, subject to disciplinary action that may include failure in a course and/or dismissal from the University.

The instructor has full authority to suspend a student from his/her class, to assign an "F" in an exercise or examination, or to assign an "F" in the course. See "***Hilltopics***" for more complete information. A report of all offenses will be sent to appropriate deans and the Office Student Judicial Affairs for possible further action.

The Honor Statement: *An essential feature of the University of Tennessee is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty.*

As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.