ROWAN UNIVERSITY
Department of Mathematics
Syllabus: Spring 2019

Math 01118: Quantitative Reasoning

I. GENERAL COURSE INFORMATION

Meeting Time & Place:
Section 2: TR 9:30-10:45am – Enterprise 406

Professor: Mrs. Christine Barden
E-Mail Address: bardenc@rowan.edu
Office Address: 2nd Floor Robinson
Office Hours: by appointment with at least 24-hour notice

Contact Notes:

Email: **Rowan** email is the preferred method for students to contact the professor. You are expected to check your email on a daily basis for any important information or updates. *If you prefer to use another email, you should set up your Rowan email to be forwarded to that email account.

Blackboard: Students are required to check the syllabus on Blackboard regularly. Any adjustments made to the syllabus will be shown on Blackboard. Additionally, students may be required to review and print documents posted on Blackboard to be brought to the following class.

Catalogue Description

Quantitative Reasoning serves students who are focused on developing quantitative literacy skills that will be meaningful for their professional, civic, and personal lives. Such reasoning is a habit of mind, seeking pattern and order when faced with unfamiliar contexts. In this course, an emphasis is placed on the need for data to make good decisions and an understanding of the dangers inherent in basing decisions on anecdotal evidence rather than data.

Rowan Core (General Education)

As of Fall 2018, all first-year undergraduate students at Rowan University must complete the new general education requirements, known as Rowan Core. (Continuing students and new transfer students will follow the existing general education requirements.) Students in Rowan Core must complete course requirements in six literacies: Artistic, Communicative, Global, Humanistic, Quantitative and Scientific. Quantitative Reasoning belongs to the Quantitative Literacy. All students in this course will be assessed on the following Rowan Core Learning Outcomes for this literacy:

- Students can outline a logical solution to complex real-world problems through simplification to a mathematical model.
- Students will apply algorithmic thinking to solve quantitative, real world problems.
- Students will evaluate the appropriateness and limitations of deterministic and probabilistic models to make informed decisions in real world situations.
- Students can define basic statistical and regression vocabulary and also qualitatively describe the meanings relative to a set of given data (e.g. mean vs. median, what does the standard deviation represent; correlation coefficients, and model parameters/

For details on the new Rowan Core and existing general education requirements, please consult your advisor or the 2018-19 Undergraduate Catalog (https://sites.rowan.edu/catalogs/).

Text

Student Course Packet bundled with MyMathLab access ISBN: 0134445619 OR 13: 9780134445618

However, I use a variety of references and sources throughout the course.

The Text is Optional

All materials used in my course will be stored electronically on Blackboard and, occasionally, printed for your use. The materials on Blackboard are in PDF format and can be downloaded to your computer and combined to serve as your "textbook." Throughout the semester, you may be required to print and bring documents posted on Blackboard. Printed sheets can be stored in a binder to serve the same purpose.

Calculator

You may access a calculator of your choice. This can include the calculator on your electronic device provided you follow the rules governing use of phones listed in the Rules and Expectations section of this syllabus. **The use of the graphing calculator (TI-84) is encouraged in dealing with data and geometry considerations.**

Materials

- A 3-ring binder with loose-leaf paper is strongly recommended. The materials stored on Blackboard will require you to print and bring the documents to class with you to successfully complete assignments.
- You should have a colored pen and a pencil each class. But, math is done best in pencil which is strongly recommended. We will use colored pens (any color but black or blue or red) to evaluate your own work as well as your peers.

Electronic Devices

During the course, I will post a Powerpoint and E-Book for each week of class. You are encouraged to bring a computer, tablet, or smartphone to class when needed to connect to the materials on Blackboard.

II. WHAT SHOULD I EXPECT TO GAIN FROM THIS COURSE?

This course is all about YOU …

- How can you shed the view of mathematics you developed before you came to this class and see mathematics as a subject that should MAKE SENSE?
- How can you come to understand that big ideas such as "Identify apparent relationships between corresponding terms." or "There are many ways to add, subtract, multiply, and divide numbers." should be the foundation of all professional careers?
- How will you understand that the U.S. focus on procedures doesn't teach to make sense of mathematics in their own ways, to make convincing mathematical arguments, and to critique and build on the ideas of their peers.

Everything you do in this course should focus on making you better at inquiring about **why** we do what we do in math, thinking about connections between mathematical concepts and procedures that permit you to **make sense** of them, reasoning about **your thinking**, and explaining and communicating that to others. My goal is to provide activities and experiences that allow **you to explain things so well that you can be understood.**

Mathematical Concepts and Ideas

Course Objectives:

- Students will draw conclusions and/or make decisions by analyzing and/or critiquing mathematical models, including situations for which the student must recognize underlying assumptions and/or make reasonable assumptions for the model.
- Students will draw conclusions and/or make decisions based on analysis and critique of quantitative information using proportional reasoning.
- Students will also effectively justify and communicate their conclusions in ways appropriate to the audience.
- Students will apply probabilistic reasoning to draw conclusions, to make decisions, and to evaluate outcomes of decisions.
- Students will draw conclusions or make decisions and communicate their rationale based on understanding, analysis, and critique of self-created or reported statistical information and statistical summaries.

III. RULES AND EXPECTATIONS

This I believe:

- John Holt was right when he said, **"*Learning is not the product of teaching. Learning is the product of the activity of learners.*"** I always say the person doing the talking is the one doing the learning.
- effort is the key to success!
- cognitive dissonance makes us smarter. (Brain Research: Struggling with challenging problems causes the brain to grow.). IT IS OKAY TO STRUGGLE THROUGH PROBLEMS.
- mathematical discourse with others allows us to gain a deeper view of mathematics. DISCUSSION ABOUT MATH WITH PEERS LEADS TO DEEPER UNDERSTANDING OF CONTENT.
- there is a human dimension to learning.
- we learn at a higher level when we care about what we are learning and with whom we are learning.
- few of us have been taught how to learn mathematics.

For these reasons, the expectations and rules given below are important.

Class Attendance and Participation

The fact that the textbook is optional implies that attendance and participation is even more significant. Therefore, the following are important.

<u>Attendance is important!</u>

- When you're not in class, you miss the interactions, questions, and activities so vital to learning,
- miss the nuances that come about through conversations, questions, and activities, and
- cannot be a supportive member of your group.

I understand that there are reasons beyond our control that cause people to miss class, but I believe we all need to make every attempt to be here. I recognize that there are excused absences which the University recognizes and I believe in their policy. However, you need to recognize that whether the absence is excused or not, you're still not there, with all that implies. If you are going to be absent, you need to let me and your group know as soon as possible. I need to know the reason, without the necessity of a lot of detail. I will keep track of all absences, including excused absences.

Attendance Rules

- Students should come to class, be on time, and stay for the entire class.
- If you know you will miss, need to come late, or leave early, you need to let me know prior to the class. **IT IS RESPECTFUL TO EMAIL ME OF AN ABSENCE.** If the reason is not identified as an excused absence by the University, each absence results in the loss attendance points in the following manner.
    - **The first unexcused absence will be a loss of 0 points, each unexcused absence after that will result in a 5-point deduction. Therefore, after 20 missed classes, you will earn a 0 for participation.**

Math is not a spectator sport! We are together for 75 minutes each class. I believe it is important that we stay focused on the learning goals and the given activities throughout that time.

Group Expectations

For much of the semester, you will work in student support groups made up of 2-3 students. I have expectations for these groups.

- The conversation is to stay on the given assignment. Speaking about math with your peers is invaluable.
- Allow ALL students to give input by being respectful, even if you disagree with their strategy.
- Group work is NOT splitting up the problems. This voids the philosophy of this course. Working together to struggle through problems is the purposeful intent.

Participation Rules

Participation is worth 100 points for the semester. Each student begins with 100 points at the beginning of the semester. For each violation of each of the following rules, five (5) points will be removed for participation.

1) While a lot of students use their cell phones as their calculators, use of a cell phone for other purposes is distracting and unacceptable. Checking text messages and social media and other non-class-focused use are all unacceptable. Surfing the net is also unacceptable unless done in pursuit of information for the class.
    a. If behavior indicates that class members cannot follow this rule, I reserve the right to have all cell phones removed from use for the remainder of the semester.
    b. If you receive an emergency call, you must take the call outside the room.
2) You sit with your assigned group unless I tell you otherwise. Class talk should focus on the learning goals and activities for that class. Discussions of other issues needs to be done before or after class.
3) If a class member is talking to the class, all members of the class, including me, must give that person their complete attention.
4) If I need to refocus the class on me, I will use my "teacher signs". I expect all conversations to stop and focus your attention on me.

IV. INSTRUCTIONAL METHODS AND ACTIVITIES

Instructional Process: Much of the instruction will occur with students working through activities, problems, and other tasks that provide some challenge of their prior knowledge. There will be a variety of activities, but in the end, it is the questions, conjectures, and relationships developed by the students that promote learning. Explaining your thinking to others serves to deepen your understanding.

Opportunities for Reflection: Many students enter my classes with little experience in explaining their thinking and making sense of concepts and skills. This course is for people who are planning on a career outside of mathematics.. Many of my students enter my class disliking or fearing mathematics and a large part of that developed because their elementary teachers didn't understand arithmetic, couldn't explain why something works as it does, and struggled to think mathematically. My goal is to ensure that you see that math can and is fun and all around us.

My Goal for Instruction and Assessment: In an article entitled "Never Say Anything a Kid Can Say" in National Council of Teachers of Mathematics magazine, Mathematics Teaching in the Middle School, Steve Reinhart stated, "My definition of a good teacher has since changed from 'one who explains things so well that students understand' to 'one who gets students to explain things so well that they can be understood.'" (Vol. 5, No. 8 April 2000)

I believe his definition is true for all mathematics instruction, but is especially true in classes for any prospective career. In your future career, you will be expected to teach, lead and see other people's perspectives. It is my expectation that students are talking and explaining. Much of that will be done in groups, but it also will occur in whole class discussions. Additionally, all work done on assessments emphasize clear work and/or explanations. This means that your thought process needs to be shown and/or explained clearly, as if you are showing and/or explaining to someone who has no idea what you are talking about.

V. EVALUATION AND GRADE ASSIGNMENT

Graded Activity	Points
Proof of Learning Activities	300 - 400
Final Exam	150
Class Attendance and Participation	100

Final Grades:

- The final grade is determined by the rounded whole percent of the earned points compared to the total possible points.
    - In my classes, I use the following percentages to determine the letter grades reported to the registrar.
        - (94,95,96,97,98,99,100)→A
        - (90,91,92,93)→A-
        - (87,88,89)→B+
        - (83,84,85,86)→B
        - (80,81,82)→B-
        - (77,78,79)→C+
        - (73,74,75,76)→C
        - (70,71,72)→C-
        - (67,68,69)→D+
        - (63,64,65,66)→D
        - (60,61,62)→D-
        - (0 through 59)→F

- After the final exams are graded, I will determine the letter grade and post it on Blackboard. You have two days to review the grades and raise any questions or request a change. At the end of the two-day review period, I will submit the grades to the registrar. Once submitted to the registrar, I will not change any grades.

Information on Graded Activities

Assignments are timed to provide maximum connection with the content be covered. Attempting to do assignments beyond a certain time does nothing to improve understanding. Unless you are redoing a permitted assessment, the assessment is due on the date identified. **Unless you have discussed issues with me beforehand, any assignment past the due date in which it was assigned will not be accepted.**

Proof of Learning Activities
***The values in brackets indicate the expected total number of points for each different type of activity. However, they are subject to change during the semester.*

1. **Your math autobiography (10).** Understanding how much you have grown as a mathematical thinker begins with knowing the math background you experienced prior to this course. This will be evaluated with a 0 – 5 rubric. If you receive less than a 5, you will have the right to make changes.

2. **Your self-evaluation of your growth as a mathematical thinker (20).** Your self-evaluation is the most significant portion of the E-portfolio. It should tie together your past, your goals, and your growth anchored to the artifacts you chose. It will be evaluated on a multi-dimensional rubric each part of which has a maximum score of 4 points.
    - **i.** Your attention to grammar and spelling
    - **ii.** How well you build from your math autobiography
    - **iii.** How well you relate your growth to your goals
    - **iv.** How well you anchor your growth statements to the artifacts you chose
    - **v.** How well your self-evaluation makes your case that you are a better mathematical thinker at the end of the course than you were when you entered

3. **Reading and Response Journals [20 points each] –** There are 3 readings throughout the semester. These readings all pertain to understanding math and it's value in the world. Each reading is assigned and due to be posted on Blackboard by the given due date at 11:59pm. Each response you make in the journal is based on three questions.
    1. **What?** What were the points of the reading?
    2. **So what?** How is this meaningful for you?
    3. **Now what?** Now that you have read this, what does it mean to you as you go forward in your life? How might you see this used in the future?

4. **Mini Assessments [20-40] –** There will be several assessments which are direct evaluations of a student's ability to do something mathematically.

5. **Partner Quizzes/Tests [40-80]??**– These test and quizzes are made by the professor, taken by all individuals without help from anyone else, and then brought to class where the team has the ability to work together to adjust their problems and/or strategies. If an individual comes to class without the completed test/quiz, that person will not participate in the group discussion. Each problem completed on a test is reviewed and evaluated on a 1-5 rubric. The total number of points for the quiz or test can be calculated by multiplying 5 by the number of problems. For example, if there are 10 problems on the test, you can assume the test is worth 50 points.

Final Exam: The final exam is a cumulative exam that will be given in the assigned room during the assigned final exam period.

- **The final is scheduled for Tuesday, April 30, 2019 Time TBD**
- ***Taking the final exam is a requirement for completing the course. Any student who does not take the final exam during the assigned final period or has not made prior arrangements with the instructor will result in a failure of the course***.

VI. DEPARTMENT AND UNIVERSITY POLICIES

Technology Policy: All uses of technologies that support the mastery of content covered in class is permissible provided it does not disturb others. **Use of cell phones and other devices for purposes other than course learning is disrespectful of the learning environment and other students. Such use is prohibited**.

Withdrawal: For more information about withdrawing, please see http://www.rowan.edu/registrar.

University Policies: (e.g., Academic Integrity, Classroom Behavior, University Attendance) are stated in the Student Information Guide (available at www.rowan.edu/studentaffairs/infoguide).

VII. ACCOMMODATION STATEMENT

Your academic success is important. If you have a disability that may impact your work in this class, please talk with me. To receive official University services and accommodations, students must notify the Academic Success Center of a documented disability. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3rd Floor of Savitz Hall. The staff of the Center is available to answer questions regarding accommodations or to assist you in your pursuit of accommodations.

VIII. ACADEMIC INTEGRITY

The integrity of academic programs is imperative to Rowan University's mission. While acknowledging the social and collaborative nature of learning, the University expects that grades awarded to students will reflect individual efforts and achievements. All members of the Rowan community are responsible for understanding what constitutes academic dishonesty; upholding academic integrity standards and encouraging others to do likewise; and knowing the procedures, rights and obligations involved in the Academic Integrity Policy. Academic dishonesty, in any form, will not be tolerated. Students who commit an act of academic dishonesty are subject to disciplinary sanctions up to and including expulsion from the university.

The entire policy, including violations and punishments, can be found at http://www.rowan.edu/provost/policies/documents/academic_integrity_policy_04-12.pdf.

CALENDAR OF CLASS CONTENT AND EXPECTATIONS

Key: Ungraded Activity, -Portfolio Submission-, **Graded Activity**

SYLLABUS CALENDAR IS PRILIMINARY AND SUBJECT TO CHANGE

Week of	Making Sense of Mathematics			Assignment
	Number Talks and Estimation 180		**Investigation and Discussion**	
Jan 22	Class Introduction Number Talks Video Billiard Ball Activity Introduction			
Jan 29	Addition/Subtraction Number Talks	Estimation 180 Days 1-5	Billiard Ball Activity	Math Autobiography Due January 29th (10 points)
Feb 5	Addition/Subtraction Number Talks	Estimation 180 Days 6-10	Inductive and Deductive Reasoning	
Feb 12	Addition/Subtraction Number Talks Assessment (16 points)	Estimation 180 Days 11-15	Fraction and Percent Activities In-Class Partner Quiz	
Feb 19	Multiplication Number Talks	Estimation 180 Days 16-20	Percent and Simple Interest Activities	Fluency Without Fear Journal Response Due February 19th (20 points)
Feb 26	Multiplication Number Talks	Estimation 180 Days 21-25	Simple and Compound Interest Activities	
March 5	Division Number Talks	Estimation 180 Days 26-30	Counting Principle In-Class Partner Quiz	
March 12	Division Number Talks	Estimation		You Can Grow Your Brain

		180 Days 31-35		Journal Response Due March 12th (20 points)
March 18	SPRING BREAK – NO CLASSES			
March 26	Multiplication/Division Number Talks	Estimation 180 Days 36-40	Permutations and Combinations Activities	
April 2	Multiplication/Division Number Talks Assessment (16 points)	Estimation 180 Days 41-45	Probability Activities	Journal Response Due April 16th (20 points)
April 9	Fraction of a Number Number Talks	Estimation 180 Days 46-50	Probability Activities In-Class Partner Quiz	
April 16	Percent of a Number Number Talks	Estimation 180 Days 51-55	Measures of Central Tendency Activities	
April 23/30	Fraction and Percent of a Number Number Talks Assessment (16 points)	Estimation 180 Days 56-60 Completed Estimation 180 sheet (60 points)	Measures of Variability Activities	Self Reflection Due (20 points) April 30th
May 5	**FINAL EXAM** **(More information to come)**			