**Tompkins Cortland Community College**

# Master Course Syllabus

**Course Discipline and Number: MATH 098** **Year: 2024-2025**

**Course Title: Quantitative Literacy** **Credit Hours: 4 equivalent**

***Attendance Policy:*** *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

***Services for Students with Disabilities:*** *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

**Course Description:** This course focuses on math for everyday life. It integrates fluency with numbers, proportional reasoning, data interpretation, algebraic reasoning, modeling, and communicating quantitative information. Mathematical concepts are investigated through group problems and class discussions based on real-life contexts of citizenship, personal finances, and medical literacy. This course prepares students to take a college-level non-STEM course in mathematics, such as MATH 200 or MATH 113. Students placing at this level and needing MATH 120 should take MATH 095 instead of this course. Additional fee required. Prerequisites: Prior completion of MATH 090 if required by placement testing. 4 Equiv. Cr. (4 Lec.) Fall and spring semesters.

**Course Context/Audience:** This course is designed for students who need to prepare for a non-STEM college level mathematics course. Students may be placed in this course through entry level assessment or if they pass the in-class, re-assessment in MATH 090. This course uses real-life applications through group discussion and extensive mathematical writing to cover concepts in Numeracy, Proportional Reasoning, Algebraic Reasoning and Applications Modeling. This course is well suited for students in degree programs that require MATH 200. Students in degree programs requiring MATH 120 or MATH 138 are strongly encouraged to enroll in MATH 095.

**Basic Skills/Entry Level Expectations**

| | |
|---|---|
| **Writing** | W1 Prior completion or concurrent enrollment in W1 ENGL 099 if required by placement testing |
| **Math** | M2 MATH 090 if required by placement testing |
| **Reading** | R1 Prior completion or concurrent enrollment in RDNG 099 if required by placement testing |

(Note: Verify that prerequisites in the course description are consistent with Basic Skill levels selected.)

**Course Goals: Student Learning Outcomes**

**Upon successful completion of this course, students will be able to:**

1. Apply the concepts of numeracy to investigate and describe quantitative relationships and solve problems in a variety of contexts.
2. Represent proportional relationships and solve problems that require an understanding of ratios, rates, proportions, scaling, and data.
3. Reason using the language and structure of algebra to investigate, represent, and solve problems.
4. Represent relationships between quantities in multiple ways (tables, equations, graphs) and solve problems that require and understanding of modeling.
5. Communicate quantitative information in writing.

*All instructors must adhere to student learning outcomes described above.*

**Course Objectives/Topics**

| Objective/Topic | # of Class Hours |
|---|---|
| **Numeracy** | |
| Quantitative situations in real life | 5 |
| Making sense of large numbers, scientific notation | 3 |
| Estimation | 2 |
| Order of operations | 3 |
| Perform multi-step calculations | 3 |
| Converting between percents, ratios, and decimals in context | 3 |
| Probability (percent and proportion) | 1 |
| **Proportional Reasoning** | |
| Using ratio and proportion to make sense of large numbers | 2.5 |
| Relative and absolute change | 2 |
| Picture data with graphs | 2.5 |
| Measures of central tendency | 4 |
| Ratio/proportion in index numbers | 2 |
| **Algebraic Reasoning** | |
| Converting units | 3 |
| Meaning and use of variables | 3 |
| Geometry and using formulas to make financial decisions | 4 |
| Solving for an unknown | 3 |
| Solving proportions | 1 |
| **Using Models** | |
| Linear models (equations, graphs, slope) | 4 |
| Exponential growth | 6 |
| Comparing linear and exponential change | 3 |
| **Note: Communicating quantitative information in writing is embedded throughout the course.** | |

## General Education Goals - Critical Thinking & Social/Global Awareness

| CRITICAL THINKING OUTCOMES | HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes) |
|---|---|
| Students will be able to<br>➢ develop meaningful questions to address problems or issues.<br>➢ gather, interpret, and evaluate relevant sources of information.<br>➢ reach informed conclusions and solutions.<br>➢ consider analytically the viewpoints of self and others. | Through analysis of real-life applications, students learn the corresponding mathematical methods for problem solving, how these are used in the specific applications, and how they can be generalized for a greater set of similar situations. Sets of similar situations are examined in each new section, and reviewed/reinforced in subsequent sections/modules. Through productive persistence, collaborative learning, discussion, and practice, students build key mathematical ideas, ask and answer questions, explain processes and discuss alternative solutions.<br><br>Based on strategies learned in current and previous modules/sections, students learn to break larger problems into smaller, manageable familiar problems, and identify and use the appropriate method of problem solving.<br><br>Students learn methods of checking answers using evaluation, inverse process, satisfaction of equations or inequalities, relationships between mathematical/algebraic expressions and graph representations of relations.<br><br>Students work in groups during dynamic, interactive, lively sessions through each module. They discuss the process of problem solving, alternative approaches to problem solving, ask questions to peers and provide explanations. Group sessions include hands-on problem solving and applying concepts learned collectively in class. |

| SOCIAL/GLOBAL AWARENESS OUTCOMES | HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes) |
|---|---|
| ➢ Students will begin to understand how their lives are shaped by the complex world in which they live.<br>➢ Students will understand that their actions have social, economic and environmental consequences. | All applications in this course focus on mathematics for everyday life. Students will investigate mathematical concepts/applications based on real-life contexts of citizenship, personal finances, and medical literacy. All concepts studied in sections/modules are relevant and designed to enrich a student's understanding of the world around him/her.<br><br>Students learn to translate real-life applications into mathematical uses; use current trends and patterns to make predictions and solve problems. Examples of global and environmental topics can be discussed and observed. |

## Instructional Methods

Multiple instructional methods will be used in this course. The basic problem cycle for each real-life application includes: Instructor launch (whole class, short lecture), Working the Problem (small group work), Class Discussion, and Wrap-up (Instructor summation). Videos and Online homework solidify in-class discussions. All instructors will adhere to the same Content Outline, Instructional Methods, Grading Policy, and Current Text(s) as outlined by the Carnegie Foundation for the Advancement of Teaching through the Quantway Initiative. Prior to teaching this course, instructors are required to participate in a Carnegie Foundation sanctioned training program and continue to work with course mentors.

## Methods of Assessment/Evaluation

| Method | % Course Grade |
|---|---|
| Module Exams | 50-75% |
| Quizzes, homework, projects, etc | 0-25% |
| Comprehensive final exam, minimum passing grade of 70% | 25-40% |
| Midterm Grades: S = 70 – 100%; U = less than 70% | |

## Text(s)

Quantitative literacy course package and curriculum materials are provided by Carnegie Foundation for the Advancement of Teaching through the Quantway Initiative.

## Bibliography

No print resources specified.

## Other Learning Resources

| |
|---|
| **Audiovisual**<br>Khan Academy videos tutorials. |
| **Electronic**<br>Canvas Platform (NIC) at Carnegie Hub for Online Homework Lessons and Lesson Solutions |
| **Other**<br>Quantway Materials developed through Carnegie Foundation for the Advancement of Teaching through the Quantway Initiative. |

**LIBRARY SERVICES REVIEW FORM**

**Title: Math098 Quantitative Literacy (Quantway)**

**Course/Program Developer: Mary Sheldon**

**Email Address: SheldoM@tompkinscortland.edu**

**Phone Number:**

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**Print Collection Resources:**

According to the master course syllabus, the course package and curriculum materials are provided by the Carnegie Foundation. The Library's print and e-book collection therefore would serve as a supplement to the provided course material. We anticipate that the students won't need materials not provided for the class, but we do maintain a basic mathematics collection and can purchase additional books or borrow books from other libraries as needed by students.

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**Databases and Periodicals Resources**

We anticipate that this course would not require student to use our databases or journals, but those we already have in the math and science field should be adequate if any needs arise.

**Media Resources:**

The Library subscribes to several streaming video services, including Academic Video Online from Alexander Street as well as Films on Demand. These collections do provide some videos to help with math concepts. The Library also provides computers that students can use for their coursework and viewing supporting materials such as Khan Academy video tutorials.

**LibGuide for Course:**

Although not usually requested for math classes, librarians can create an online guide for the course at the teacher's request, using a tool called LibGuides.

**Instructional/Research Support**

While we typically don't have a lot of math students coming to the Library for research help, librarians are available to provide support or instructions to students on an individual or whole-class basis. Students may get help in a variety of ways, including in-person or by phone, email, text, chat or through a link in their Blackboard course. In addition, tutoring services are housed within the Library.

**Librarian's Signature and Date:**

Karla Block, 9-14-16