

MATH 105: Intro to Mathematical Structures

Prerequisite(s): None

Credits: 3



I. Course Description

Though some students may take a later course in mathematics (e.g. statistics), this course is designed to be a terminal course for students in selected majors who do not require further study in mathematics. Topics include an introduction to basic concepts of algebra, basic concepts of set theory, Introduction to logic, an introduction to probability and a statistical investigation of data, and an introduction to applied mathematical models including certain aspects of consumer mathematics.

II. Course Objectives

A student *should* be able to perform the following after completing this course:

1. Perform operations with real numbers; understand the order of operations with real numbers
2. Know basic properties of addition and multiplication with real numbers.
3. Know how to add, subtract, multiply and divide rational numbers.
4. Simplify a square root radical.
5. Have an understanding of operations with decimals and percent.
6. Solve linear equations and applied linear equations.
7. Determine ratios and proportions.
8. Solve linear inequalities.
9. Understand the basic concepts of set theory.
10. Use Venn Diagrams and have a working knowledge of sets and subsets.
11. Work with set operations.
12. Understand cardinalities of sets
13. Be able to work with different compound statements as an introduction to Logic
14. Be able to construct Truth Tables; conjunctions, disjunctions, conditionals, and bi-conditionals
15. Determine if two statements are equivalent.
16. Analyze arguments using Truth Tables.
17. Have a working knowledge of basic Probability concepts.
18. Find the probability of events involving “not”, “or”, and “and”.
19. Find the expected values of events.
20. Construct frequency distributions, frequency histograms, and read bar graphs.
21. Calculate measures of central tendency – mean, median, mode.
22. Calculate measures of dispersion – variation and standard deviation.
23. Find the z-score and calculate the percentile

24. Find areas (percentages) under the standard normal curve
25. Demonstrate an understanding of the time value of money
26. Work problems about consumer credit.
27. Find the monthly payments for a home mortgage.

III. Course Textbooks and Materials

****Students must purchase in advance texts and/or materials for this course.***

MyMathLab – Standalone Access Card, 4th edition (Required)

Pearson (2003)

ISBN: 9780321199911

Mathematical Ideas, 13th edition (2015)

Charles Miller, Vern Heeren, John Hornsby

Pearson

ISBN: 9780321977076

Calculator: A calculator is required. Non-graphing scientific calculators are recommended.

*Access to MyMathLab is required to complete the homework and exams. Access to MyMathLab is not free. You will have to pay a fee to use it. Access can be purchased easily through our Blackboard course, **or** you can purchase an access code from the CSU bookstore. This access includes a copy of the ebook: **Mathematical Ideas** (13th edition) by Miller, Heeren, and Hornsby (ISBN 13: 9780321977076).

IV. Module Information

* Please note that **this is a 15-week course** and the schedule will work differently than the usual 7-week online courses. You should expect information from the instructor about how the course schedule will work. Each module will last 1-3 weeks.

Module One (Weeks 1 – 3)

Chapter 6: Real Numbers and Their Representations

Module

A review of math fundamentals including orders of operations, fractions, square roots and decimals

HW Assignments: HW 6.1 – 6.5

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 6 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 6 Exam

Module 2 (Weeks 4 – 5)

Chapter 7: The Basic Concepts of Algebra

Description

Using linear equations, proportions, and linear inequalities to solve problems

HW Assignments: HW 7.1 – 7.4

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 7 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 7 Exam

Module 3 (Weeks 6 – 7)

Chapter 2: The Basic Concepts of Set Theory

Description

An investigation of what sets are, how to combine them together, how to visualize sets, and how to use them to understand survey information

HW Assignments: HW 2.1 – 2.4

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 2 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 2 Exam

Module 4 (Weeks 8 – 9) –
Chapter 3: Introduction to Logic

Description

An introduction to the basics of logic including the negation, logic operations, truth tables, and arguments

HW Assignments: HW 3.1 – 3.4, & 3.6, Logic Project

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 3 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 3 Exam

Module 5 (Weeks 10 – 11)
Chapters 11 & 12: Probability and Statistics

Description: Probability basics and an introduction into descriptive statistics including visual displays, measures of position, measures of dispersion, and normal distributions.

HW Assignments: HW 11.1 – 11.2, & 12.1 – 12.5

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 11 & 12 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 11 & 12 Exam

Module 6 (Weeks 12 – 14)

Chapters 13: Personal Financial Management

Description

Basic financial math including consumer credit, home loans, and amortization tables.

HW Assignments: HW 13.1 – 13.4, Mortgage Project

You should refer back to the text and multimedia library for help as you complete these homework assignments.

Review: Chapter 13 Review Quiz

The review quiz does not count for a grade, it is simply used to prepare for the exam. You may attempt the review quiz as many times as you like. You may also access the homework assignments in review mode or the study plan for extra practice. Reworking an assignment in review mode will not change your grade on those assignments.

Exam: Chapter 13 Exam

Module 7 (Week 15)

Final Exam

Description

Review and prepare for a comprehensive final exam

HW Assignments: None

Review: Final Review Quiz

You may take the Final Review Quiz as many times as you like. It is not for a grade. You may also rework old assignments in review mode or use the study plan. Working an assignment in review mode will not change your grade.

Exam: Final Exam

V. Course Information and Grading

Course Requirements

This course will be taught online using MyMathLab which is integrated into Blackboard. Each student will need access to the Internet, preferably with a high-speed connection. Use **MyMathLab Browser Check** to load the necessary applications. Please take some time to familiarize yourself with MyMathLab. If needed, there is online help.

Homework, Projects, Discussions and Practice Exams

Students should expect to spend at least 6 to 8 hours per week performing the assigned work. Instructor assigned MyMathLab homework will be factored into the student's

grade. All instructor assigned homework in MyMathLab may be worked on and edited (up to 5 attempts) by the student throughout the designated time window. However, all work must be completed by the student (alone) on or before the designated due date. Other than the instructor, the services of MyMathLab and the text, any other outside help with the instructor assigned MyMathLab homework is forbidden. The student is strongly urged to attempt the MyMathLab tracked and untracked exercises at the end of each section of MyMathLab's multimedia text but this will not be factored into the student's grade. Practice exams will also be assigned, but the practice exam score will not be factored into the student's grade. The student must complete the practice exam before taking the actual timed exam. The student may use their notes and book during the practice exam. Also, the practice exams are not timed and the student may stop and restart. All exams may be printed with the student's answers and the correct answers after the exam is submitted.

For some chapters, you will also be required to contribute to a discussion. These discussions may or may not count for a grade. Each discussion will include its own instructions, which will be posted as an announcement at the beginning of a chapter.

As part of your homework grade, I will also include a couple of projects. These projects will simply require you to use the skills covered within the course to answer more in depth questions than MyMathLab allows. The projects will take the form of a short 2 – 3 page paper. Each project counts as a homework grade.

The instructor-assigned MyMathLab homework and projects count as 35% of the student's course grade.

Calculator: A calculator is required. Non-graphing scientific calculators are recommended.

Course Exams: (35% of final grade) There will be seven exams during the semester. The exam must be completed on or before the designated due date and may be attempted only once. Once you begin an exam, you will have 90 minutes to complete it. You may not stop and restart the exam. Although the use of notes and text are not strictly forbidden during the taking of the exam, the student will have between 60 and 90 minutes to complete the exam. Again, the student must complete the practice exam before taking the actual timed exam.

Any outside help (e.g. another person) during the taking of the exam is strictly forbidden and will be considered a violation of CSU's Academic Integrity Policy. A violation of this type will result in the student receiving an F in the course with the violation being placed in the student's file.

Late and Make-up Assignments

All deliverables are due by 11:59 PM on the due dates indicated. When substantive emergencies occur, acceptance of late submissions is left to the discretion of the course instructor.

Assignments that are submitted after the due date with prior written approval (text or email) from the instructor may receive the following deductions:

1. Late assignments are subject to a deduction of 10% of the available points for each day late.
2. Assignments submitted later than one week after due date will not be accepted and will receive a zero (0).
3. No work may be submitted after the last day of the course.
4. See Class Discussions for late discussion post policy.

NO MAKE UPS will be given **AFTER** the exam window. A missed exam will result in a zero recorded for that exam.

Final Exam: (30% of final grade) All students must take the 2 hour comprehensive Final Exam. ****ALL students are required to take the final exam at the time designated on the course schedule.**

Grading Scale and Assigned Letter Grades

Charleston Southern Online Undergraduate classes follow the following numerical and letter grading scale. Grades will be posted by the Sunday night following the closing of the Module. No grades will be given to students over the phone.

A = 90-100

B+ = 87-89

B = 80-86

C+ = 77-79

C = 70-76

D = 60-69

F = <60

Help:

This course is a distance education course. It is therefore incumbent on the student to read the assigned sections, do the work and stay within the course syllabus/schedule. MyMathLab has included a multimedia text, which includes several wonderful features such as video lectures and interactive exercises. There are also other ways for the

student to receive instructional help. This includes the following:

- Learning aids such as “Help Me Solve This” and “View an Example”
- Pearson’s Tutoring Center (The student must register for this)
- Instructor help through MyMathLab’s “Ask the Instructor”