Cincinnati Christian University
Math 110 Problem Solving and Number Systems
Spring 2019 | 3 semester credit hours
Monday/Wednesday/Friday 11:00 a.m. – 11:50 a.m. Presidents' Hall 251

Instructor: Julie Bedi, PhD EdD	Office Location: PH 267
Email: julie.bedi@ccuniversity.edu	Office Hours: 12:00 – 1:00 daily or by appointment

Foster School of Biblical Studies, Arts & Sciences

Cincinnati Christian University exists to educate men and women to live by Biblical principles and transformed lives, empowering them with character, skills, insight, and vision to advance the kingdom and impact society for Christ. CCU is committed to providing a Christ-centered, liberal arts education taught with a Christian worldview in students' chosen fields of study.

Course Description

Number systems and their properties; elements of number theory and an algorithmic approach to arithmetic operations using integers; data collection and introductory statistics; and probability. Emphasis on problem solving. Prerequisite: Satisfactory performance on a placement examination or successful completion of MATH 010.

Course Rationale

Since some understanding of mathematics will enhance the study of every discipline, as well as develop skill in mathematical reasoning and competence in real world situations, this class will be particularly relevant to an informed and aware Christian citizenry.

Arts & Sciences Departmental Outcomes

CCU's Arts & Sciences program is designed to prepare students to

1. Communicate effectively in both oral and written forms in a variety of rhetorical contexts, including Standard English.

2. Adeptly utilize modern research and writing tools.

3. Identify decisive events and ideas in the human experience and assess their influences on modern culture and thought.

4. Employ critical and creative thinking and mathematic and scientific principles for problem solving, literary and socio-cultural analysis, intercultural understanding, and research in the sciences and humanities.

5. Demonstrate the integration of academic insights and experiences by constructing and employing a personal framework in which ethical decisions can be made in light of societal values and a Christian worldview.

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Course Learning Objectives:

After completing this course, the student should be able to:

1. Use multiple problem-solving techniques to solve problems (connected to Arts & Sciences Learning Outcome #4).

2. Understand and apply concepts of number, number theory, and number systems (A&S #4).

3. Understand and apply numerical computation, mental math, and estimation techniques in problem solving (A&S #4).

4. Use fractions, decimals, percentages, ratios, proportions, and integers in problem solving (A&S #4).

5. Communicate mathematical ideas in written and oral form using everyday and mathematical language between student and student; student and instructor (A&S #1).

6. Make connections among ideas in mathematics and connect mathematics to other disciplines and real-world situations (A&S #4).

Required Text and Technology

Using & Understanding Mathematics: A Quantitative Reasoning Approach, 6th Edition. Jeffrey Bennett and William Briggs, Pearson, Boston 2015.

All students are required to have access to **a textbook and **a scientific calculator**. Textbooks and calculators should be brought to class each day for use during class. **Phones and laptops will not be permitted in class or during tests unless special permission is requested/granted in advance**.**

Grading Policy

Students are expected to learn both the mathematics covered in class and the mathematics in the textbook. Completing homework is part of the learning experience.

When reviewing for quizzes and tests, students should 1) review class notes and consult appropriate sections in the text, 2) go to the Learning Center and/or to Dr. Bedi's office hours, and 3) do extra unassigned textbook problems as needed for additional practice. Mathematics is learned by doing. Thinking through problems carefully and thoroughly will be emphasized over speed and memorization.

Letter grades will be assigned based on the published grade point system in the CCU Academic Catalog. Grades will be comprised of the following. Note that "assignments" includes any graded class activities, homework, pop quizzes, and/or projects.

Tests	50%
Assignments	30%
Final Exam	20%

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Academic Integrity

This class will follow CCU's regulations pertaining to academic integrity. A copy may be found in CCU's Student Handbook.

Disability Services

Students who require academic accommodations due to a documented physical, psychological, or learning disability may request assistance from the Student Services Department. Students are encouraged to complete this process within the first two weeks of the semester. The Student Services Department is located on the upper level of Presidents Hall. You may also contact the office by phone at 244-8150.

Attendance

You are expected to attend all class sessions and actively participate in examples and activities. If you *must* be absent due to illness or an emergency, you are responsible for obtaining any lecture notes or class activity information from the professor or other students.

If you exceed the absentee policy set forth by CCU (i.e. more than six absences from this course), it will result in a grade of FA (failure due to absences), and you will be dropped from the course. **Arriving late to class (i.e. after attendance has been taken) three times will equal one absence.** If you arrive after class attendance has been taken, it is your responsibility to inform the professor after class of your late arrival. Otherwise, you may be counted absent. Also, if a student is present for less than half of a class, it is considered an absence.

Late Assignments

An assignment will be considered late if it is not submitted by the due date and time. If you find yourself in a situation that prohibits you from completing an assignment on time, you should address the issue with Dr. Bedi **prior** to the due date. Late assignments will not be accepted; however the lowest assignment grade (one) will be dropped at the end of the semester. Students who are absent because of CCU extracurriculars should plan to submit assignments early.

Tests

Tests and exams assess whether the objectives are being met. If a student misses a scheduled test or exam without making prior arrangements with the instructor, it cannot be made up unless the instructor makes an exception. Even then, a penalty may be given. It is the responsibility of the student to take the quiz/test early or schedule a makeup quiz/test date with academic support within one week of the original test date. The final exam will occur at the end of the semester and will be cumulative. **Please do not make summer travel arrangements until receiving the final exam schedule from the Registrar's Office.**

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Course Outline
Chapter 1: Thinking Critically (Objectives Summary page 67)
1A: Living in the Media Age
1B: Proposition and Truth Values
1C: Sets & Venn Diagrams
1D: Analyzing Arguments
1E: Critical Thinking in Everyday Life
Chapter 2: Approaches to Problem Solving (Objectives Summary page 117)
2A: Working with Units
2B: Problem Solving with Units
2C: Problem Solving Guidelines & Hints
Chapter 3: Numbers in the Real World (Objectives Summary page 183)
3A: Uses and Abuses of Percentages
3B: Putting Numbers in Perspective
3C: Dealing with Uncertainty
3D: Index Numbers
3E: How Numbers Deceive
Chapter 4: Managing Money (Objectives Summary pages 282-283)
4A: Taking Control of Your Finances
4B: The Power of Compounding
4C: Savings Plans and Investments
4D: Loan Payments, Credit Cards, and Mortgages
4E: Income Taxes
4F: Understanding the Federal Budget
Chapter 5: Statistical Reasoning (Objectives Summary page 357)
5A: Fundamentals of Statistics
5B: Should You Believe a Statistical Study?
5C: Statistical Tables & Graphs
5D: Graphics in the Media
5E: Correlation & Causality
Chapter 7: Probability (Objectives Summary page 469)
7A: Fundamentals of Probability
7B: Combining Probabilities
7C: The Law of Large Numbers
7D: Assessing Risk
7E: Counting and Probability
Chapter 8: Exponential Astonishment (Objectives Summary page 511)
8A: Growth: Linear versus Exponential
Chapter 9: Modeling Our World (Objectives Summary page 553)
9A: Functions: The Building Blocks of Mathematical Models
Chapter 11: Mathematics and the Arts (Objectives Summary page 629)
11A: Mathematics and Music

The instructor reserves the right to change or amend any part of this course plan as deemed necessary.

Tests and assignments will be announced during class and through Canvas.