# Course Number, Title and Credits

**MATU 103** - Applied Mathematics - 3 credits

# Course Catalog Description

This course presents contemporary and historical topics in mathematics and discusses their use in modern business, science, social science, and other applications. Students will explore mathematical concepts in a real-world context. These concepts include problem-solving methods, set theory, graph theory, number theory, algebraic modeling, probability, statistics, voting methods, fair division, economics, and finance topics. 3 credits.

# Learning Outcomes and Assessment

Learning Outcomes are statements that specify what learners will know, understand, or be able to demonstrate at the end of a learning experience.

Types of Learning Outcomes include:

- Course Learning Outcome – Result of finishing a course.
- Program Learning Outcome – Result of finishing a program.
- Institutional Learning Outcome – Result of finishing a degree at an institution, reflecting the core learning values and experiences of all graduates.

A Signature Assignment is an assignment used to measure a student's mastery of a program or institutional learning outcome. If a course you are taking includes a Signature Assignment, it will be clearly marked (**SIGNATURE ASSIGNMENT**).

[Click here](#) to access information on the Program Learning Outcomes (PLOs) and/or Institutional Learning Outcomes (ILOs) and Curriculum Map related to this course.

# Essential Equipment

All students must have reliable access to a working computer with Internet access throughout each week of the class. Each student will need to be able to access and work in the University's online Learning Management System, Blackboard. For more information about personal computer requirements click here.

# Additional Required Equipment and Facilities

- MyMathLab access code (can be purchased with a hardback textbook, or purchased independently from www.mymathlab.com - see Textbook section below for cost options)
- Scientific calculator (free online versions available)
- MyMathLab login and requested software installation

# Academic Integrity

As a learning community of scholars, the University of Massachusetts Global emphasizes the ethical responsibility of all its members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will not be tolerated. "Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation of information in oral or written form. Such violations will be dealt with severely by the instructor, the dean/center director, and the standards committee. Plagiarism means presenting someone else's idea or writing as if it were your own. If you use someone else's idea or writing, be sure the source is clearly documented." Other guidelines for acceptable student behavior are specified in the University Catalog.

UMass Global online library resources: https://www.chapman.edu/library/umassglobal

# University Policies

Students are responsible for complying with university policies including, but not limited to: incompletes, course drops, and student conduct. Information may be found in the Brandman University Catalog: http://catalog.brandman.edu/

# Required Textbooks

**MyLab Math with Pearson eText for Mathematics All Around -- Instant Access (18-Week), 7th Edition**
Required
9780136965961
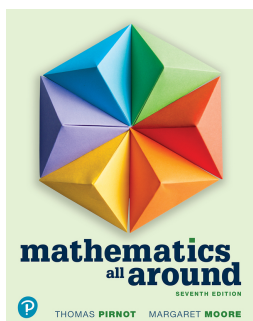
Relevant, approachable math for todays liberal arts students

In an increasingly complex world where both information and misinformation are growing rapidly, its important that students learn to think critically and become comfortable with the numerical information all around them. The high-interest applications, emphasis on problem solving, and clear writing style of Mathematics All Around make it an approachable and interesting program for students of all levels and backgrounds. Additionally, tools in the MyLab® enrich the student learning experience and help instructors gauge student performance, making it effective for courses in any format (including online courses).

With new co-author Margaret Moore, the 7th Edition builds on this successshowing instructors and students how they can use various apps, spreadsheets, and other technologies in their problem solving, incorporating GeoGebra and Excel Spreadsheets in some examples, and more. Mathematics All Around is also particularly well-suited for students who need to satisfy a one- or two-course math requirement in order to transfer or graduate.

Thomas Pirnot, Margaret Moore
Pearson
2022
7th ed.

**Mathematics All Around [RENTAL EDITION]**
Optional
9780136921950
This print textbook is available for students to rent for their classes. The Pearson print rental program provides students with affordable access to learning materials, so they come to class ready to succeed.

Only for students who wish to have a physical copy of the book in addition to the ebook. Students must purchase MyLab Math with Pearson eText for Mathematics All Around above.

Thomas Pirnot, Margaret Moore
Pearson
2022
7th ed.

All student textbooks are available at the University of Massachusetts Global Bookstore:

https://www.bkstr.com/umassglobal/home

# Course Learning Outcomes

By the end of the course, students should be able to:

1. Analyze a mathematical problem and determine the optimal solutions.
2. Analyze, interpret, and create graphs.
3. Explain graph theory techniques to solve real-world problems.
4. Apply number theory techniques to solve real-world problems.
5. Evaluate and solve algebraic equations and inequalities and apply algebraic models to real world problems.
6. Apply concepts from probability and statistics to solve real-world problems.
7. Understand and execute financial modeling methods to solve real-world problems.
8. Understand and apply mathematical equations applied to apportionment and voting.
9. Integrate mathematical ideas into a final project by describing how mathematical knowledge and skills are applied to work or community issues, as well as used to interpret social or economic trends.

# Major Study Units

1. Problem Solving and Set Theory

2. Graph Theory and Number Theory

3. Algebraic Models

4. Consumer Mathematics

5. Apportionment and Voting

6. Counting and Probability

7. Statistics

# Instructional Strategies

This class includes readings, textual and video instruction, exercises, discussions, and projects. Instructional Strategies are further explained in the Blackboard course shell.

# Attendance Policy

Requirements for student attendance and participation will be defined by each instructor based on the following policy:

- Monday of the first week is considered the first day of class for online and blended instruction. This includes instruction for fully online classes and online instruction supporting blended classes.

- Regular onsite attendance is expected for student success. If a student misses more than one onsite class or one week of engagement in an online class, the student may, at the discretion of the instructor, fail the course. Students are expected to attend all classes, particularly the first night of class.

- Students who will miss more than one class have the responsibility to discuss their attendance with the instructor in advance. Students should also consider withdrawing from a course if they will be absent more than once. Instructors may, but are not obligated to, accommodate students under extraordinary circumstances, but the student must request accommodation and provide requested supporting documentation.

- If a student misses a portion (e.g., arriving late or leaving early) of an onsite course, the student's grade may be adversely affected. Students who are not in attendance for at least 75 percent of any scheduled class may be considered absent for that class. Students should discuss missing portions of a class with their instructor to determine how their grade may be affected.

- Regular online attendance/participation and engagement is expected for student success in both fully online and blended courses. Online participation is evident through posting to a discussion board, wiki, virtual office or classroom meeting, a drop box, attending a virtual seminar, completing real-time activities or quizzes, or other course-related activities (synchronous or asynchronous).

- Schools and programs may have different attendance policies. Refer to school and program specific information for additional attendance policies.

# Letter Grade/Percentage Equivalents

**Grade Point System**
**(Rounded up at .5 and up)**

| A = 94%-100% | B = 84%-86% | C = 74%-76% | D = 64%-66% |
|---|---|---|---|
| A- = 90%-93% | B- = 80%-83% | C - =70%-73% | D - = 60%-63% |
| B+ = 87%-89% | C+ = 77%-79% | D+ = 67%-69% | F = 59% and below |

# Methods of Evaluation for Determining Grades

**Assignment Detail for <u>Fully Online Course</u>:**

| Assignments for Blended and Online course - Refer to Rubric(s) in Course Information on Blackboard | Number of Assignments | Points per Assignment | Total Possible Points |
|---|---|---|---|
| Introduction Discussion Board | 1 | 20 | 20 |
| Topic Discussion Boards | 8 | 40 | 320 |
| MyMathLab Orientation (Posted with its due date on MyMathLab) | 1 | 20 | 20 |
| MyMathLab Homework (Posted with their due dates on MyMathLab) | 7 | 40 | 280 |
| MyMathLab Final Exam (Posted with its due date on MyMathLab) | 1 | 100 | 100 |
| Signature Assignment Outline (Due in Week 4) | 1 | 60 | 60 |
| SIGNATURE ASSIGNMENT (Due in Week 8) | 1 | 200 | 200 |
| | | | **Total: 1000** |

# Class by Class Outline for Fully Online Course:

| Week | Topics | Assignments |
| --- | --- | --- |
| **Week 1** | Problem Solving and Set Theory | • Reading Chapters 1 and 2<br>• Introduction Discussion Board<br>• Discussion Board<br>• MyMathLab Orientation<br>• MyMathLab Homework 1 |
| **Week 2** | Graph Theory and Number Theory | • Reading Chapters 4 and 6<br>• Discussion Board<br>• MyMathLab Homework 2 |
| **Week 3** | Algebraic Models | • Reading Chapters 7<br>• Discussion Board<br>• MyMathLab Homework 3 |
| **Week 4** | Consumer Mathematics | • Reading Chapters 8<br>• Discussion Board<br>• MyMathLab Homework 4<br>• Signature Assignment Outline |
| **Week 5** | Apportionment and Voting | • Reading Chapters 10 and 11<br>• Discussion Board<br>• MyMathLab Homework 5 |
| **Week 6** | Counting and Probability | • Reading Chapters 12 and 13<br>• Discussion Board<br>• MyMathLab Homework 6 |
| **Week 7** | Statistics | • Reading Chapters 14<br>• Discussion Board<br>• MyMathLab Homework 7 |
| **Week 8** | Final | • Discussion Board<br>• MyMathLab Final Exam |

# Methods of Evaluation for Determining Grades

## Assignment Detail for <u>Blended Course</u>:

| Assignments for Blended and Online course - Refer to Rubric(s) in Course Information on Blackboard | Number of Assignments | Points per Assignment | Total Possible Points |
|---|---|---|---|
| Introduction Discussion Board | 1 | 20 | 20 |
| Topic Discussion Boards | 8 | 40 | 320 |
| MyMathLab Orientation (Posted with its due date on MyMathLab) | 1 | 20 | 20 |
| MyMathLab Homework (Posted with their due dates on MyMathLab) | 7 | 40 | 280 |
| MyMathLab Final Exam (Posted with its due date on MyMathLab) | 1 | 100 | 100 |
| Signature Assignment Outline (Due in Week 4) | 1 | 60 | 60 |
| SIGNATURE ASSIGNMENT (Due in Week 8) | 1 | 200 | 200 |
| | | | **Total: 1000** |

# Class by Class Outline for Blended Course:

| Week | Topics | Assignments |
| --- | --- | --- |
| **Week 1** | Problem Solving and Set Theory | <ul><li>Reading Chapters 1 and 2</li><li>Introduction Discussion Board</li><li>Discussion Board</li><li>MyMathLab Orientation</li><li>MyMathLab Homework 1</li></ul> |
| **Week 2** | Graph Theory and Number Theory | <ul><li>Reading Chapters 4 and 6</li><li>Discussion Board</li><li>MyMathLab Homework 2</li></ul> |
| **Week 3** | Algebraic Models | <ul><li>Reading Chapters 7</li><li>Discussion Board</li><li>MyMathLab Homework 3</li></ul> |
| **Week 4** | Consumer Mathematics | <ul><li>Reading Chapters 8</li><li>Discussion Board</li><li>MyMathLab Homework 4</li><li>Signature Assignment Outline</li></ul> |
| **Week 5** | Apportionment and Voting | <ul><li>Reading Chapters 10 and 11</li><li>Discussion Board</li><li>MyMathLab Homework 5</li></ul> |
| **Week 6** | Counting and Probability | <ul><li>Reading Chapters 12 and 13</li><li>Discussion Board</li><li>MyMathLab Homework 6</li></ul> |
| **Week 7** | Statistics | <ul><li>Reading Chapters 14</li><li>Discussion Board</li><li>MyMathLab Homework 7</li></ul> |
| **Week 8** | Final | <ul><li>Discussion Board</li></ul> |

| | | • MyMathLab Final Exam<br>• Signature Assignment |
| --- | --- | --- |

## Americans with Disabilities Act Statement

For students who require disability-related services or accommodations to access to their educational experience can register with the Office of Accessible Education (OAE). The Office of Accessible Education (OAE) is committed to ensuring equal educational access and opportunity for all members of our academic community. Students will be provided equitable and reasonable accommodations and services that are in compliance with [Section 504 of the Federal Rehabilitation Act of 1973](#) and the [Americans with Disabilities Act of 1990 (ADA)/Americans with Disabilities Act Amendments Act of 2008 (ADAA)](#). Registration with OAE is on a voluntary, self-identifying basis. Please visit the [Office of Accessible Education (OAE)](#) website for more information about how to register for services, eligibility requirements, and information about potential academic accommodations and services.

## UMass Global's Behavioral Intervention Team

The University of Massachusetts Global Behavioral Intervention Team (BIT) addresses situations in which students, faculty, staff, vendors, contractors, or general visitors are displaying behaviors that are concerning, disruptive, or threatening in nature and that potentially impede their own or others' ability to function successfully or safely. The mission of the University Behavioral Intervention Team is to provide a proactive and supportive multidisciplinary team approach to prevention, assessment, and early intervention of situations or individuals that may pose a threat to the safety and wellbeing of themselves or the University community as a whole.

It is the responsibility of faculty, staff, and students to immediately report any situation that could possibly result in harm to anyone at the University to the BIT by calling 949-383-3119, emailing [safe@umassglobal.edu](mailto:safe@umassglobal.edu), or by filling out the BIT referral form [here](#). For more additional information on the University Behavioral Intervention Team, please visit our website [here](#). A "crisis" is defined as a situation in which a person may pose an active or immediate risk of violence to self or others.In these cases, the local police should be contacted by calling 911.

## UMass Global's Title IX Statement

The University of Massachusetts Global strives to maintain and foster a climate that promotes respect and human dignity. Sexual misconduct and relationship violence in any form is antithetical to the university's mission and core values, violates university policies, and may also violate federal and state law. The office of Title IX is primarily concerned for students' safety and well-being and is tasked with investigating all reports of sexual misconduct experienced by our community members. Title IX prohibits sex-based and gender-based discrimination and harassment, which includes discrimination based on pregnancy and/or pregnancy-related complications, parental status, and marital status. Students expecting or experiencing pregnancy-related complications, that may require educational accommodations, should contact the University's Title IX Coordinator and/or the Office of Accessible Education.

The University and Title IX's prohibition of sex discrimination also covers sexual harassment, sexual violence, and any other form of sexual misconduct. We offer options and resources to all students affected by these issues and are committed to providing a fair, thorough, and prompt investigation and adjudication process. If you or someone you know has been impacted by sexual assault, dating, and domestic violence, stalking, or sexual exploitation, please visit the [University's Title IX Resource Page](#) to access additional resources and information.

UMass Global's staff and faculty are tasked with reporting any possible sex or gender-based discrimination or Title IX violations to the University's Title IX Coordinator at [civilrightscomplaints@umassglobal.edu](mailto:civilrightscomplaints@umassglobal.edu).

[Click on this Link to our University Title IX Policy](#)