MATH320

Course Summary

Course : MATH320 **Title :** Mathematical Modeling
Length of Course : 8
Prerequisites : MATH220 **Credit Hours :** 3

Description

Course Description: This course introduces students to the fundamental concepts of math modeling. It integrates the student's previous experiences with mathematical concepts to provide a variety of practical methods to solve problems. The course covers mathematical concepts such as graphs, inequalities, slopes, linear regression, matrices, operations and applications of matrices, linear programming, sets,Venn diagrams, permutations, combinations, binomial theorem, and an introduction to logic. (Prerequisite: MATH220)

Course Scope:

Successful completion of this course will provide you with a variety of concepts. This course is delivered online and will include topics such as graphs, inequalities, slopes, linear regression, matrices, operations and applications of matrices, linear programming, sets, Venn diagrams, permutations, combinations, binomial theorem, and an introduction to logic.

Objectives

After successfully completing this course, you will be able to

- Create graphs of lines and points.
- Compute the slope of a line.
- Use regression to solve problems
- Solve equations and provide solutions to word problems
- Implement basic matrices operations
- Use linear programming to solve problems
- Use Venn diagrams and sets to logically solve a problem
- Compute combinations and permutations and understand when to use them.
- Use the binomial theorem to solve problems.
- Prepare truth tables to solve problems.

Outline

Week 1: Coordinate Systems, Graphs, Linear Inequalities

Learning Objectives

LO-1: Create graphs of lines and points.

LO-4: Solve equations and provide solutions to word problems

Readings

Text Readings:
Goldstein, Sections 1.1-1.2

Assignment

Introductory Forum Post #1
Homework #1

Week 2: Intersection of 2 lines, Slope, Least Squares Line

Learning Objectives

LO-2: Compute the slope of a line.
LO-3: Use regression to solve problems
LO-4: Solve equations and provide solutions to word problems

Readings

Text Readings:
Goldstein, Sections 1.3-1.5

Assignment

Forum Post #2
Homework #2
Quiz #1 Week 2

Week 3: Systems of Linear Equations

Learning Objectives

LO-4: Solve equations and provide solutions to word problems
LO-5: Implement basic matrices operations

Readings

Text Readings:
Goldstein, Sections 2.1-2.2

Assignment

Homework #3

Week 4: Operations on Matrices and Inverses of Matrices

Learning Objectives

LO-4: Solve equations and provide solutions to word problems
LO-5: Implement basic matrices operations

Readings

Text Readings:
Goldstein, Sections 2.3-2.4

Assignment

Forum Post #4
Homework #4
Quiz #2 Week 4

Week 5: Linear Programming

Learning Objectives

LO-6: Use linear programming to solve problems

Readings

Text Readings:
Goldstein, Sections 3.1-3.3

Assignment

Homework #5

Week 6: Sets and Venn Diagrams

Learning Objectives

LO-7: Use Venn diagrams and sets to logically solve a problem.

Readings

Text Readings:
Goldstein, Sections 5.1-5.3

Assignment

Homework #6
Quiz #3 Week 6

Week 7: The Multiplication Principle, Permutations, Combinations and Binomial

---

Learning Objectives

LO-8: Compute combinations and permutations and understand when to use them.
LO-9: Use the binomial theorem to solve problems.

Readings

Text Readings:
Goldstein, Sections 5.4-5.7

Assignment

Forum Post #7
Homework #7
Written Assignment

Week 8: Logic, Truth Tables, Implication and Equivalences

Learning Objectives

LO-10: Prepare truth tables to solve problems.

Readings

Text Readings:
Goldstein, Sections 12.1-12.4

Assignment

Forum Post #8
Homework #8
Practice Final
Final Exam

Evaluation

Forum Assignments: There will be an Introductory Forum worth 1.5% of the final grade and 7 other Forums in Weeks 2, 3, 4, 5, 6, 7, and 8 worth 1.5% each for a total of 12% of the final grade.

Written Assignment: There will be a written assignment in Week 7 worth 12% of the final grade. Go to Assignments and then Written Assignment to see the Requirements.

Homework Assignments: There will be 8 MML homework assignments in Weeks 1-8 worth 5% each for a total of 40% of the final grade.

Quizzes: There will be 3 Quizzes in the Quizzes for weeks 2, 4, and 6 worth 7% each for a total of 21% of the final grade.

Final Exam: There will be a Final Exam worth 15% of the Final Grade. It is recommended that you take the Practice Final first.

Grading:

Name	Grade %
Forums	12.00 %
Introductory Forum	1.50 %
Week 2 Forum	1.50 %
Week 3 Forum	1.50 %
Week 4 Forum	1.50 %
Week 5 Forum	1.50 %

Week 6 Forum	1.50 %
Week 7 Forum	1.50 %
Week 8 Forum	1.50 %
Homework	40.00 %
Homework 1	5.00 %
Homework 2	5.00 %
Homework 3	5.00 %
Homework 4	5.00 %
Homework 5	5.00 %
Homework 6	5.00 %
Homework 7	5.00 %
Homework 8	5.00 %
Quizzes	21.00 %
Quiz 1 Week 2 Critique	7.00 %
Quiz 2 Week 4 Critique	7.00 %
Quiz 3 Week 6 Critique	7.00 %
Written Assignment	12.00 %
Written Assignment	12.00 %
Final Exam	15.00 %
Final Exam Critique	15.00 %
Honor Code	1.00 %
APUS Honor Code and Pledge	1.00 %

Materials

Book Title: MATH320 Pearson MyLab access provided inside the classroom

Author:

Publication Info: Pearson

ISBN: 1269589040

Book Title: Finite Mathematics & Its Applications, 11th Ed - The VitalSource e-book is provided via the APUS Bookstore

Author: Goldstein, et. al.

Publication Info: Pearson

ISBN: 9780321878052

Book Title: You must validate your cart to get access to your VitalSource e-book(s). If needed, instructions are available here - http://apus.libguides.com/bookstore/undergraduate

Author: N/A

Publication Info: N/A

ISBN: N/A

Web Sites

In addition to the required course texts, the following public domain web sites are useful. Please abide by the university's academic honesty policy when using Internet sources as well. Note web site addresses are subject to change.

Site Name	Website URL/Address
Mathematics Videos	**http://www.apus.edu/media/mathWV/contemporary.htm**
Apus YouTube Videos	http://www.youtube.com/playlist?list=PL7C0A83E5C7608F6D
Purple Math	**http://www.purplemath.com/**
Khan Academy	**http://www.khanacademy.org/**
Just Math Tutorials	**http://patrickjmt.com/**
Combinations and Permutations	**http://www.mathsisfun.com/combinatorics/combinations-permutations.html**
Microsoft Mathematics	**Microsoft Mathematics**
Math vids	http://mathvids.com/

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

Student Handbook

- Drop/Withdrawal policy

- Extension Requests
- Academic Probation
- Appeals
- Disability Accommodations

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.