Course Syllabus

Math 1332– Contemporary Mathematics

Catalog Description: Intended for Non STEM (Science, Technology, Engineering, and Mathematics) majors. Topics include introductory treatments of sets and logic, financial mathematics, probability and statistics with appropriate applications. Number sense, proportional reasoning, estimation, technology, and communication should be embedded throughout the course. Additional topics may be covered.

Lecture hours = 3, **Lab hours** = 0

Prerequisites: TSI Math Complete.

Semester Credit Hours: 3
Lecture Hours per Week: 3
Lab Hours per Week: 0
Contact Hours per Semester: 48
State Approval Code: 27.0101.51 19

Class section meeting time: This class is offered face-to-face in the fall semesters. In the spring and summer, it is offered online. Online students are expected to spend at least 3-4 hours per week reading, reviewing, and participating in assigned activities for successful completion of this course.

Alternate Operations During Campus Closure: In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Panola College to move to altered operations. During this time, Panola College may opt to continue delivery of instruction through methods that include, but are not limited to: online learning management system (CANVAS), online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor Panola College's website (www.panola.edu) for instructions about continuing courses remotely, CANVAS for each class for course-specific communication, and Panola College email for important general information.

Artificial Intelligence (AI) Course Policy: There are situations throughout the course where you may be permitted to use artificial intelligence (AI) tools to aide in further understanding of mathematical concepts. However, AI tools may not be used for any graded assignments including but not limited to exams, quizzes, and projects. Use of any AI-generated content in this course without the instructor's consent qualifies as academic dishonesty and violates Panola College's standards of academic integrity.

Core Components and Related College Student Learning Outcomes
This course counts as part of the academic requirements of the Panola College Core Curriculum and an Associate of Arts or Associate of Science degree. ☒ Yes   ☐No: If no, skip to Instructional Goals.

The items below marked with an X reflect the state-mandated outcomes for this course **IF this is a CORE course**:

☒ Critical Thinking Skills – to include creative thinking, innovation, inquiry and analysis, evaluation and syntheses of information

   ☐ CT1: Generate and communicate ideas by combining, changing, or reapplying existing information

☒ CT2: Gather and assess information relevant to a question

☒ CT3: Analyze, evaluate, and synthesize information

☒ Communication Skills – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication

☒ CS1: Develop, interpret, and express ideas through written communication

☐ CS2: Develop, interpret, and express ideas through oral communication

☐ CS3: Develop, interpret, and express ideas through visual communication

☒ Empirical and Quantitative Skills – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

☒ EQS1: Manipulate and analyze numerical data and arrive at an informed conclusion

☐ EQS2: Manipulate and analyze observable facts and arrive at an informed conclusion

☐ Teamwork – to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

☐ TW1: Integrate different viewpoints as a member of a team

☐ TW2: Work with others to support and accomplish a shared goal

☐ Personal Responsibility – to include the ability to connect choices, actions, and consequences to ethical decision-making

☐ PR1: Evaluate choices and actions and relate consequences to decision-making

☐ Social Responsibility – to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

☐ SR1: Demonstrate intercultural competence

☐ SR2: Identify civic responsibility

☐ SR3: Engage in regional, national, and global communities

Instructional Goals and Purposes: Upon completion of MATH 1332, the student will be able to demonstrate:

1. Competence in describing sets, subsets, and performing set operations.

2. Competence in solving consumer math problems, including percent, loans, simple and compound interest, and mortgage payments.

3. Competence in solving probability problems, including single- and multi-stage experiments.

4. Competence in applications with permutations and combinations.

5. Competence in finding measures of central tendency, probability and statistics.

6. Competence in discerning correct information from various types of graphs.

Learning Outcomes: Upon completion of MATH 1332, the student will be able to demonstrate:

1. Apply the language and notation of sets.

2. Determine the validity of an argument or statement and provide mathematical evidence.

3. Solve problems in mathematics of finance.

4. Demonstrate fundamental probability/counting techniques and apply those techniques to solve problems.
5. Interpret and analyze various representations of data.

6. Demonstrate the ability to choose and analyze mathematical models to solve problems from real-world settings, including, but not limited to, personal finance, health literacy, and civic engagement.

Course Content:

A general description of lecture/discussion topics included in this course are listed in the Learning Objectives / Specific Course Objectives sections of this syllabus.

Students in all sections of this course will learn the following content:

1. Describe quantities and how they change.

2. Write an equivalent fraction or decimal, given a percent.

3. Find a percent of a whole.

4. Calculate absolute and relative change given two quantities.

5. Express a relationship as a rate.

6. Write a proportion equation given two rates or ratios and solve the proportion equation.

7. Determine when two quantities don't scale proportionally, or more information is needed.

8. Find the area and volume of a geometric figure.
9. Define and implement a plan for solving mathematical problems.

10. Calculate sales tax, property tax.

11. Calculate flat tax, progressive tax, and regressive tax.

12. Define units of length, wright, and capacity and convert from one to another.

13. Perform arithmetic calculations on units of length, weight, and capacity.

14. Solve application problems involving units of length, weight, and capacity.

15. Describe the general relationship between the U.S. customary units and metric units of length, weight/mass, and volume.

16. Define the metric prefixes and use them to perform basic conversions among metric units.

17. Solve application problems involving metric units of length, mass, and volume.

18. State the freezing and boiling points of water on the Celsius and Fahrenheit temperature scales.

19. Convert from one temperature scale to the other, using conversion formulas.

20. Describe memberships of sets, including the empty set, using proper notation, and decide whether given items are members and determine the cardinality of a given set.

21. Perform the operations of union, intersection, complement, and difference on sets using proper notation.

22. Describe the relations between sets regarding membership, equality, subset, and proper subset, using proper notation.

23. Be able to draw and interpret Venn diagrams of set relations and operations and use Venn diagrams to solve problems.

24. Recognize when set theory is applicable to real-life situations, solve real-life problems, and communicate real-life problems and solutions to others.

25. Combine sets using Boolean logic, using proper notations.

26. Use statements and conditionals to write and interpret expressions.

27. Use a truth table to interpret complex statements or conditionals.

28. Write truth tables given a logical implication, and it's related statements – converse, inverse, and contrapositive.

29. Determine whether two statements are logically equivalent.

30. Use DeMorgan's laws to define logical equivalences of a statement.

31. Discern between an inductive argument and a deductive argument.

32. Evaluate deductive arguments.

33. Analyze arguments with Venn diagrams and truth tables.

34. Use logical inference to infer whether a statement is true.

35. Identify logical fallacies in common language including appeal to ignorance, appeal to authority, appeal to consequence, false dilemma, circular reasoning, post hoc, correlation implies causation, and straw man arguments.

36. Calculate future value and payments for savings annuities problems.

37. Calculate present value and payments for payout annuities problems.

38. Calculate present value and payments for loans problems.

39. Determine the appropriate financial formula to use given a scenario by recognizing key words and examining frequency of deposits or withdrawals, and whether account is growing or decreasing in value.

40. Analyze a home mortgage refinance scenario, forming judgments by combining calculations and opinion.

41. Solve a financial application for time using logarithms.

42. Define the population and the parameters of a study.

43. Discern between a census and a population.

44. Define the sample and statistics of a study.

45. Classify data as categorical or quantitative.

46. Identify an appropriate sample for a study.

47. Identify possible sources of sampling bias.

48. Identify different techniques for sampling data.

49. Define the population and the parameters of a study.

50. Discern between a census and a population.

51. Define the sample and statistics of a study.

52. Classify data as categorical or quantitative.

53. Identify an appropriate sample for a study.

54. Identify possible sources of sampling bias.

55. Identify different techniques for sampling data.

56. Present categorical data graphically using a frequency table, bar graph, Pareto chart, pie charts, pictograms.

57. Present quantitative data graphically using histograms, frequency tables, pie charts, or frequency polygons.

58. Define the measures of central tendency for a sample of data including mean, median, mode.

59. Define measures of variation of a sample of data including range, standard deviation, quartiles, box plots.

60. Describe a sample space and simple and compound events in it using standard notation.

61. Calculate the probability of an event using standard notation.

62. Calculate the probability of two independent events using standard notation.

63. Recognize when two events are mutually exclusive.

64. Calculate a conditional probability using standard notation.

65. Compute a conditional probability for an event.

66. Use Baye's theorem to compute a conditional probability.

67. Calculate the expected value of an event.

Methods of Instruction/Course Format/Delivery:

Methods employed by faculty will include lecture/demonstration, discussion, problem solving, analysis, and reading assignments. Homework will be assigned. Faculty may choose from, but are not limited to, the following methods of instruction:

1. Lecture

2. Discussion

3. Internet

4. Video

5. Television

6. Demonstrations

7. Field trips

8. Collaboration

9. Readings

10. Projects

Major Assignments/Assessment:

Faculty may assign both in- and out-of-class activities to evaluate students' knowledge and abilities. Faculty may choose from – but are not limited to -- the following methods: attendance, class preparedness and participation, collaborative learning projects, exams/tests/quizzes, homework, internet, library assignments, readings, research papers, scientific observations, student-teacher conferences, and written assignments.

The Mathematics Department does not accept late work.

Assessment(s):

1. Exams per chapter or over combined chapters

2. Projects/Group work/Research

3. Comprehensive Final Exam/Project

Course Grade:

Assignment Weights	
Class Participation	10%
Homework/Quiz Average	15%
Exams	55%
Comprehensive Final Exam	20%

Letter Grades for the Course will be assigned as follows:

A: 90 < Average < 100

B: 80 < Average < 90

C: 70 < Average < 80

D: 60 < Average < 70

F: 00 < Average < 60

Texts, Materials, and Supplies:

- Textbook: Math for Liberal Arts Lumen Learning (No Purchase Necessary)
- Lumen OHM (No Purchase Necessary)
- Canvas Access
- Desmos Calculator (No Purchase Necessary)

Other:
- Courses conducted via video conferencing may be recorded and shared for instructional purposes by the instructor.
- For current texts and materials, use the following link to access bookstore listings: https://www.panolacollegestore.com
- For testing services, use the following link: https://www.panola.edu/student-services/student-support/academic-testing-center
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Charles C. Matthews Student Center or go to https://www.panola.edu/student-services/student-support/disability-support-services for more information.
- Panola College welcomes pregnant and parenting students as a part of the student body. This institution is committed to providing support and adaptations for a successful educational experience for pregnant and parenting students. Students experiencing a need for accommodations related to pregnancy or parenting will find a Pregnancy and Parenting Accommodations Request form in *The Pathfinder* or may request the form from the course instructor.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder: https://www.panola.edu/* (located at the bottom under students)