MATH-1470: MODERN MATHEMATICS FOR BUSINESS AND SOCIAL SCIENCE I

Cuyahoga Community College

Viewing: MATH-1470: Modern Mathematics for Business and Social Science I

Board of Trustees:
September 2019

Academic Term:
Fall 2020

Subject Code
MATH - Mathematics

Course Number:
1470

Title:
Modern Mathematics for Business and Social Science I

Catalog Description:
First of two-semester sequence. Topics include functions, mathematics of finance, linear systems, matrix algebra and linear programming with applications in business and social sciences.

Credit Hour(s):
4

Lecture Hour(s):
4

Lab Hour(s):
0

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
MATH-0965 Intermediate Algebra, or appropriate score on Math Placement Test, or departmental approval: equivalent coursework.
Note: MATH-1200 or 1280 completed prior to Fall 2016, or MATH-1270 completed prior to Summer 2017 will also meet prerequisite requirements for this course.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour. Courses offered in other part of terms (e.g. 14 week, 8 week, flexibly scheduled, etc.) ensure equivalent workloads. Students should prioritize their time accordingly, particularly when taking part of term courses.
II. ACCESSIBILITY STATEMENT

Tri-C is committed to providing online services, software, and electronic information that is accessible and usable by all of our students, including those with disabilities. It is our mission to provide accessible opportunities and services by complying with Federal and State accessibility guidelines. If you need any special course adaptations or accommodations because of a documented disability, please contact Student Accessibility Services (SAS) (https://www.tri-c.edu/student-accessibility-services/) or SAS via email at CCCSAS@TRI-C.EDU. Students have the right to request accommodations at any point in the semester; however, accommodations are not retroactive.

Eastern (216) 987-2052 – Voice. (216) 987-2423 – Fax
Metropolitan (216) 987-4344 – Voice. (216) 987-3257 – Fax
Western (216) 987-5079 – Voice. (216) 987-5118 - Fax.
Westshore (216) 987-3900 – Voice. (216) 987-5294 - Fax.
Brunswick (216) 987-5079 – Voice. (216) 987-5118 - Fax.
Off-Site (216) 987-5079 – Voice

III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts. Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available at http://www.tri-c.edu/student-resources/documents/studenthandbook.pdf You must also
VI. CORONAVIRUS/COVID-19 STATEMENT

Students are responsible for adhering to all College health and safety guidance, including that which relates to the COVID-19 pandemic. Public health requirements and standards are changing rapidly, and the College is adapting its guidance accordingly. Please check your Tri-C email and visit tri-c.edu/coronavirus regularly for updates. All students must adhere to the following general guidelines, until further notice:

• Remain at home if you are ill or experiencing symptoms of illness. Do not attend any in-person class or gathering.
• Notify your instructor(s) if you are ill, have tested positive for COVID-19, or were exposed to an individual who has tested positive for COVID-19 and they will report the information to the Tri-C Compliance & Risk Management team and you may be contacted for follow-up information.
• Wear a mask or face covering at all times, including, but not limited to: upon entering and exiting any Tri-C facility, in class, and in all common areas.
• Maintain a distance of at least six feet between yourself and others at all times and if you must pass near an individual do it quickly and do not linger.
• Provide the College with relevant information about your current health status and participate in any required on-site checks (e.g., temperature checks, current contact information, symptom profile, etc.).
• Use only designated areas of Tri-C facilities, including entrances and exits. Sign in and out of Tri-C facilities as directed.

The general guidelines listed above do not encompass all coronavirus-related guidance. These guidelines are subject to change at the discretion of the College and under the direction of public health authorities. Students who fail to adhere to this guidance may be subject to disciplinary action under the College’s Student Code of Conduct and the Student Judicial Code.

Outcomes

Course Outcome(s):
Analyze, define, and utilize functions of various types.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):
1. Define functions and function notation.
2. Determine the domain and range of a function.
3. Graph linear and other basic functions and use the vertical line test.
4. Use linear functions to solve application problems relating to cost/revenue/profit, marginal analysis, break-even analysis, and supply/demand.
5. Graph quadratic functions, including determining the vertex, intercepts, and axis of the parabola.
6. Use quadratic functions to solve application problems relating to cost/revenue/profit, break-even analysis, and supply/demand.

Course Outcome(s):
Analyze, define, solve, and utilize exponential and logarithmic equations and functions.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):
1. Define, graph, and evaluate exponential functions.
2. Apply exponential functions to exponential growth and decay problems.
3. Define, utilize the properties of, and evaluate logarithms.
4. Graph and apply logarithmic functions.
5. Solve exponential equations, logarithmic equations, and their applications.
Course Outcome(s): Interpret, evaluate, and apply various formulas related to the mathematics of finance.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):
1. Interpret and compute simple interest.
2. Compute future value, present value, and interest rate using simple interest.
3. Interpret and compute compound interest, including continuous compounding.
4. Compute future value, present value, and interest rate using compound interest, including continuous compounding.
5. Interpret and compute effective rate (annual percentage yield).
6. Compute future value and present value of ordinary annuities and annuities due.
7. Compute the necessary payment for amortization and sinking funds.

Course Outcome(s): Analyze, graph, solve, and apply systems of linear equations, including utilization of matrices.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):
1. Solve systems of two linear equations in two variables by graphing, substitution, and elimination.
2. Solve systems of linear equations in two or more variables using the Gauss-Jordan Method.
4. Define an m x n matrix, a row matrix, and a column matrix.
5. Perform basic operations on matrices including addition, subtraction, scalar multiplication, and multiplication.
6. Interpret and compute the inverse of a matrix.
7. Use the inverse of a matrix to solve a system of linear equations.

Course Outcome(s): Analyze, graph, solve, and apply systems of linear inequalities.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):
1. Graph linear inequalities and systems of linear inequalities in two variables.
2. Solve linear programming problems and applications graphically using the Corner Point Theorem.
3. Solve linear programming problems and applications in Standard Maximum Form using the Simplex Method.

Methods of Evaluation:
1. Periodic exams.
2. Quizzes.
3. Homework.
4. In class collaborative work.
5. Comprehensive final exam.
Course Content Outline:

1. Functions
   a. Definition of a function and function notation
   b. Domain and range of a function
   c. Graphs of linear and other basic functions and the vertical line test
   d. Applications of linear functions relating to cost/revenue/profit, marginal analysis, break-even analysis, and supply/demand
   e. Graphs of quadratic functions, vertex, intercepts, and axis of the parabola
   f. Applications of quadratic functions relating to cost/revenue/profit, break-even analysis, and supply/demand

2. Exponential and logarithmic equations and functions
   a. Exponential functions and graphs
   b. Exponential growth and decay
   c. Evaluating logarithms and properties of logarithms
   d. Logarithmic functions, graphs, and applications
   e. Exponential equations, logarithmic equations, and applications

3. Mathematics of finance
   a. Simple interest
   b. Future value, present value, and interest rate for simple interest
   c. Compound interest, including continuous compounding
   d. Future value, present value, and interest rate for compound interest, including continuous compounding
   e. Effective rate
   f. Future value and present value of ordinary annuities and annuities due
   g. Amortization and sinking funds

4. Systems of linear equations and matrices
   a. Systems of two linear equations in two variables: solve by graphing, substitution, and elimination
   b. Systems of linear equations in two or more variables: Gauss-Jordan Method
   c. Applications of systems of linear equations
   d. m x n matrix, row matrix, and column matrix
   e. Addition, subtraction, scalar multiplication, and multiplication of matrices
   f. Inverse of a matrix
   g. Solving systems of linear equations using the inverse of a matrix

5. Systems of linear inequalities
   a. Graphing linear inequalities and systems of linear inequalities
   b. Solving linear programming problems and applications graphically using the Corner Point Theorem
   c. Solving linear programming problems and applications in Standard Maximum Form using the Simplex Method

Resources


Instructional Services

OAN Number:
Ohio Transfer Module TMMSL

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