MATH 10 Course Outline as of Fall 2018

CATALOG INFORMATION

Dept and Nbr: MATH 10 Title: NATURE OF MATH
Full Title: Nature of Mathematics
Last Reviewed: 10/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
A survey course in mathematical concepts and mathematics in culture. Topics to include mathematical reasoning and four additional topics selected from number theory, probability, statistics, mathematical modeling, contemporary applications, geometry, and the history of mathematics. Recommended for liberal arts students.

Prerequisites/Corequisites:
Course Completion of MATH 154 or Course Completion of MATH 155 or higher

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: A survey course in mathematical concepts and mathematics in culture. Topics to include mathematical reasoning and four additional topics selected from number theory, probability, statistics, mathematical modeling, contemporary applications, geometry, and the history of mathematics. Recommended for liberal arts students. (Grade or P/NP)
Prerequisites/Corequisites: Course Completion of MATH 154 or Course Completion of MATH

155 or higher
Recommended:
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	B	Communication and Analytical Thinking	Fall 1981	
	MC	Math Competency		
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B4	Math/Quantitative Reasoning	Fall 1981	
IGETC:	**Transfer Area**		Effective:	Inactive:
	2A	Mathematical Concepts & Quantitative Reasoning	Fall 1981	

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Upon completion of the course, students will be able to:
1. Define inductive reasoning, and apply to patterns and sequences.
2. Define deductive reasoning, and apply to logic and sets.
3. Demonstrate ability to perform four of the following objectives:
   A. Define various sets of numbers and use number systems of different bases.
   B. Apply counting techniques, permutations, combinations, and probability models.
   C. Define frequency distributions and measures of central tendency and dispersion, and create graphical displays of data.
   D. Apply mathematical models such as linear, quadratic, exponential, and logarithmic, to real-world problems.
   E. Understand topics within contemporary mathematics, such as voting and apportionment, financial mathematics, graph theory, linear programming, and applications of matrices.
   F. Define and apply concepts of areas, volumes, Euclidean and non-Euclidean geometry, and selected other topics in geometry.
   G. Describe the historical development of mathematics, the role of theorem and proof in mathematical thought, and significant mathematical results and mathematicians.

Topics and Scope:

I. Mathematical reasoning
   A. Inductive reasoning

    1. Patterns
    2. Sequences
  B. Deductive reasoning
    1. Logic
    2. Sets

Four additional topics chosen from II through VIII.

II. Number theory
  A. Sets of numbers (e.g. prime, perfect, amicable, etc.)
  B. Numeration systems and number bases
  C. Additional topics may be chosen from identification numbers, encoding data, modular arithmetic, and cardinal numbers
III. Probability
  A. Counting techniques
  B. Rules of probability
  C. Conditional probability
  D. Probability models and simulations
IV. Statistics
  A. Frequency distributions
  B. Measures of central tendency and dispersion
  C. Graphical display of data
  D. Additional topics may be chosen from normal curve, estimation, and margin of error
V. Mathematical modeling
  A. Linear, quadratic, exponential, and logarithmic models
  B. Regression models
VI. Contemporary applications
  Types of applications to be chosen by instructor, but could include one or more of the following:
  A. Linear programming
  B. Matrices
  C. Financial mathematics
  D. Voting and apportionment
  E. Graph theory
VII. Geometry
  A. Areas and volumes
  B. Euclidean geometry and deductive systems
  C. Non-Euclidean geometry
  D. Additional topics may be chosen from conic sections, trigonometry, fractal geometry, polyhedra, symmetry and tesselations
VIII. History and culture of mathematics
  A. Overview of the historical development of mathematics
  B. Role of theorem and proof in mathematical thought
  C. Significant mathematical results and mathematicans

Assignment:

1. Daily reading outside of class (approximately 20-50 pages per week).
2. Problem set assignments from required text(s) or supplementary materials chosen by the instructor (approximately 1-6 per week).
3. Quizzes (approximately 0-4 per week).

4. Exams (approximately 3-8 per term).
5. Projects (for example computer explorations or modeling activities, approximately 0-10 per term).

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem sets, projects	Problem solving 5 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice and free response exams, quizzes	Exams 75 - 95%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Thinking Mathematically (6th). Blitzer, Robert. Prentice Hall: 2014.
Mathematics: A Practical Odyssey (7th). Johnson & Mowry, Cengage: 2012 (classic)