

MATHEMATICS I - CERTIFICATE



MTSC

Students can earn a certificate in Mathematics by completing 23 credits in Mathematics. Students earning a certificate in Mathematics are encouraged to explore other electives in mathematics to broaden their abilities and credentials.

This certificate is recommended for students who have an interest in eventually going into STEM fields such as Physics, Computer Science or Engineering, or students pursuing a career where mathematical thinking and abilities are essential.

Program Learning Outcomes

Upon completion of this program, a student will be able to:

1. Study the basics of sets and set theory. Use sets to solve problems involving surveys and use sets as a basis for describing other things (intervals, domains, ranges, etc...) in mathematics.
2. Use logic to write and resolve symbolic arguments.
3. Study mathematical functions, graphs, and use functions as models.
4. Calculate rates of change, solve optimization problems and related rate problems.
5. Calculate areas, volumes, average values, center of mass, and probabilities.
6. Study vectors and use vectors as a problem-solving tool.
7. Display quantitative and qualitative data and draw conclusions from such displays.
8. Calculate probabilities of random events and understand the key concepts about probability distributions.
9. Use decision theory to make conclusions which are based on data and probability calculations.
10. Use logic to write basic mathematical proofs.
11. Manipulate expressions, solve equations, graph two variable equations, define functions and use these things to solve problems.
12. Solve triangles, graph periodic functions, use trigonometric identities to solve problems involving trigonometric equations and use trigonometric functions as mathematical tools.
13. Define and graph exponential, logarithmic, polynomial, rational and trigonometric functions. Define and graph conic sections and graph equations in polar and parametric forms.

Certificate Requirements

Code	Title	Hours
MATH 1139	Mathematics for Liberal Arts Students (or MATH 1139C) <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	3
MATH 1200	College Algebra (or MATH 1200C) <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	4
MATH 1240	Statistical Analysis I	4
MATH 2110	College Trigonometry <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	4

MATH 2111	Pre-Calculus Mathematics <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	4
Choose ONE of the following:		4
MATH 2131	Applied Calculus <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	
MATH 2141	Calculus I <small>MSCI; Scientific Reasoning; Quantitative Literacy</small>	
Total Hours		23

Students must earn 23 credits in mathematics by completing all of the courses appearing in the list above to earn a certificate. If a student takes a placement test and tests out of a class on the list or has taken a class on the list at an accredited institution, then the department chair or program director may award credit (toward the certificate) for that class. **Note: There are no waivers for MATH 1139. All students must take MATH 1139.**

MATH 2141 is required for students who wish to take more classes beyond calculus and/or earn a certificate in Advanced Undergraduate Mathematics (Future Certificate).

Recommended Course Sequence

Course	Title	Hours
Year 1		
Semester 1		
MATH 1200	College Algebra (or MATH 1200C)	4
MATH 1139	Mathematics for Liberal Arts Students (or MATH 1139C)	3
Hours		7
Semester 2		
MATH 2110	College Trigonometry	4
MATH 1240	Statistical Analysis I	4
Hours		8
Summer Session		
MATH 2111	Pre-Calculus Mathematics (Summer Session I)	4
Choose ONE of the following:		4
MATH 2131	Applied Calculus (Summer Session II)	
MATH 2141	Calculus I (Summer Session II)	
Hours		8
Total Hours		23