CATALOG TERM: 2023-2027 **TOTAL UNITS REQUIRED = 120**

MATHEMATICS

Applied Option

- This worksheet is intended for supplemental use only. The University will use your Academic Requirements Report (ARR) to track your graduation requirements, including those for your major. Please continue to check your ARR for accuracy. If your ARR requires a correction, please submit an ARR Correction Form.
- Your Degree Planner will display the following requirements in the University's recommended sequence.
- All courses used for the major, including preparation for the major must be completed with a grade of C (2.0) or better.
- A minimum of 21 upper-division units in MATH must be completed at CSUSM.
- No more than 3 units of either MATH 498 or 499 may be applied toward the major.
- No more than 3 units of MATH 495 may be applied toward the major.
- All non-articulated courses MUST be reviewed and approved in advance by a Mathematics faculty advisor.

MATHEMATICS CORE COURSEWORK (33 UNITS)

Lower-division Calculus Courses (13 units):

✓	Course	Units
☐	MATH 160: Calculus with Applications I (*MATH 125, 126 or pass Calculus Readiness Diagnostic)	5
☐	MATH 162: Calculus with Applications II (*MATH 160)	4
☐	MATH 260: Calculus with Applications III (*MATH 162)	4

Non-Mathematics Supporting Courses (8 units):

✓	Course	Units
☐	CS 111: Computer Science I (^MATH 125, 126, or 160)	4
☐	PHYS 201: Physics of Mechanics and Sound (*MATH 160)	4

Mathematics Core Courses (12 units)

✓	Course	Units
☐	MATH 264: Introduction to Linear Algebra (*MATH 162)	3
☐	MATH 350: Foundations for Theoretical Math (*MATH 160 with an A- or higher or MATH 162)	3
☐	MATH 378: Number Systems (*MATH 350)	3
☐	MATH 441: Introduction to Probability (*MATH 260)	3

APPLIED OPTION REQUIREMENTS (29-31 UNITS)

Science Requirement (11-13 units):

Select one Emphasis:

___ **Chemistry/Biology Emphasis**

___ **Physics Emphasis**

Chemistry/Biology Emphasis:

✓	Course	Units
☐	CHEM 150: General Chemistry (*MATH 101, 103, 105 or MATH Category 1 or 2)	4
☐	CHEM 150L: General Chemistry Lab (^CHEM 150)	1

Choose 6-8 units from the following:

BIOL 210: Introduction to Cellular and Molecular Biology (4) (^CHEM 150)
BIOL 211: Introduction to Organismal and Population Biology (4)
BIOL 212: Evolution (4) (*BIOL 210 or 211)
BIOL 215: Experimental Design and Statistical Analysis (4)
CHEM 160: General Chemistry II (3) (*CHEM 150, 150L and MATH 125, 126, 132, 150, or 160)
CHEM 201 **and** 201L: Organic Chemistry + lab (4) (*CHEM 160 or 162)

**prerequisite; ^co/prerequisite*

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MATHEMATICS

Applied Option

✓	Course	Units
☐		
☐		

Physics Emphasis:

✓	Course	Units
☐	PHYS 202: Physics of Electromagnetism and Optics (*PHYS 201 or 205 and MATH 162)	4

Choose 7-9 units from the following:

PHYS 203: Modern Physics (4)
PHYS 270: Introduction to Computational Physics (3) (*PHYS 201, MATH 160, CS 111)
PHYS 320: Classical Mechanics (3) (*PHYS 201 or 205; ^MATH 346)
PHYS 321/EE 321: Electromagnetism (3) (*PHYS 202 or 206 and MATH 260)
PHYS 323: Quantum Physics (3) (*PHYS 203; ^MATH 346)
PHYS 324: Statistical Mechanics and Thermodynamics (3)

✓	Course	Units
☐		
☐		

Upper-division Option Requirements (18 units):

✓	Course	Units
☐	MATH 362: Differential Equations (*MATH 162)	3
☐	MATH 364: Intermediate Linear Algebra (*MATH 264 and MATH 270 with B or higher or MATH 350)	3
☐	MATH 430: Foundations of Analysis (*MATH 378)	3

Select 1 course from the following:

MATH 442: Introduction to Mathematical Statistics (*MATH 441)
MATH 444: Regression Analysis (*MATH 441 and MATH 264 or 374)

✓	Course	Units
☐		3

Select 1 course from the following:

MATH 443: Stochastic Processes with Simulation (*CS 111 and MATH 264 or 364 and MATH 342 or 441)
MATH 448: Mathematical Models and Methods in Biology
MATH 464: Numerical Analysis and Computing (*CS 111, MATH 162)
MATH 465: Introduction to Numerical Linear Algebra (*CS 111 and MATH 264 or 374)
MATH/CS 480: Introduction to Optimization (*MATH 264 or 374)

✓	Course	Units
☐		3

Upper-division Elective (3 units):

Select any MATH course numbered 410-499 or 505 and higher and not already used in the major.

- Physics Emphasis students may substitute a Physics course numbered 400 or higher with Mathematics faculty advisor approval.
- Chemistry/Biology emphasis students may substitute a Chemistry/Biology course numbered 400 or higher with Mathematics faculty advisor approval.

✓	Course	Units
☐		3

**prerequisite; ^co/prerequisite*

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