

BIOTECHNOLOGY

- 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](#) (in [mycsusm.edu](#)) will display the following requirements in the University's recommended sequence.
- All courses used for the major and preparation for the major must be completed with a grade of C (2.0) or higher.
- All non-articulated courses MUST be reviewed and approved by a faculty advisor.
- A minimum of 40 units of upper-division coursework must be completed to meet graduation requirements.
- Course offerings are subject to change. Verify course availability with Biotechnology faculty advisor.

PREPARATION FOR THE MAJOR (33-34 UNITS)

Need ☒		Course	Units	Sem	Grade
☐	☐	CHEM 150: General Chemistry (*CPE ^c , CHEM 101 or 105 and MATH 101, 105 or MATH Category 1 or 2)	4		
☐	☐	CHEM 150L: General Chemistry Lab (+CHEM 150) PC CHEM 110^ + CHEM 110L	1		
☐	☐	CHEM 160: General Chemistry II (*CHEM 150, 150L and *MATH 125 or 132) PC CHEM 115	3		
☐	☐	CHEM 201: Organic Chemistry (*CHEM 160) PC CHEM 220	3		
☐	☐	CHEM 201L: Organic Chemistry Lab (+CHEM 201) PC CHEM 220	2		
☐	☐	CHEM 202: Organic Chemistry (*CHEM 201, 201L) PC CHEM 221	3		
☐	☐	MATH 132: Calculus with Applications I (*MATH 105 or MATH Category 1 or 2) PC MATH 130	3		
☐	☐	PHYS 205: Physics for Biological Sciences I (*MATH 132 or 160) PC PHYS 200	4		
☐	☐	PHYS 206: Physics for Biological Sciences II (*PHYS 201 or 205 and MATH 132 or 160) PC PHYS 201	4		
☐	☐	PSYC 100: Introduction to Psychology or SOC 101: Introduction to Sociology PC PSYC 100 or PC SOC 100	3-4		
☐	☐	PHIL 315, PHIL 340 or PHIL 345: Ethics	3		

MAJOR REQUIREMENTS (54 UNITS)

Lower-division Coursework (20 units):

Need ☒		Course	Units	Sem	Grade
☐	☐	ACCT 201: Introduction to Financial Accounting PC ACCT 201	3		
☐	☐	ACCT 202: Introduction to Managerial Accounting (*ACCT 201) PC ACCT 202	3		
☐	☐	BIOL 210: Introduction to Cellular & Molecular Biology (+CHEM 150) PC BIOL 200	4		
☐	☐	BIOL 211: Introduction to Organismal & Population Biology (*BIOL 210) PC BIOL 201	4		
☐	☐	BIOL 215: Experimental Design and Statistical Analysis no equivalency	4		
☐	☐	BIOT 257: Foundations of Biotech (formerly BIOL 357, may not earn credit for both; *BIOL 210) no equivalency	2		

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Upper-division Coursework (26 units):

Need ☒

Course	Units	Sem	Grade
BIOT 355: Molecular Biotechnology (*BIOL 210, 211; fall only)	5		
BIOT 356: Cellular Biotechnology (*BIOL 210, 211; spring only)	5		
BIOT 460: Scientific Communication in Biotechnology (*BIOT 355 or 356; spring only)	3		
BIOT 457: Case Studies in Biotech Product Dev (*BIOT 257 and BIOT 355 or 356; spring only)	3		
BIOL 477: Immunology (*BIOL 351 or BIOT 355)	3		
MGMT 302[^]: Foundations of Management (*ACCT 201, 202, MATH 132 and PSYC 100 <i>or</i> SOC 101)	2		
MKTG 302[^]: Foundations of Marketing (*ACCT 201, 202, MATH 132 and PSYC 100 <i>or</i> SOC 101)	2		

Choose 1 of the following courses:

CHEM 341: General Biochemistry (*CHEM 201)

CHEM 351: Biochemistry I (*CHEM 202; students who select CHEM 351 must also take CHEM 352 as an Elective below; **fall only**)

Need ☒

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Course	Units	Sem	Grade
	3		

Upper-division Elective Coursework (8 units minimum):

BIOL 367: Biology of Microorganisms (4) (*BIOL 210, 211; **fall only**)

BIOL 456: Molecular Med & Mechanisms of Disease (3) (*BIOL 351, 352, 353, 477, 504, BIOT 355, 356 or instructor consent)

BIOL 477L: Immunology Laboratory (1) (*BIOL 477)

BIOL 480: Bioinformatics (4) (*BIOL 351, 352 or BIOT 355)

BIOL 489: Introduction to Laboratory/Field Research (2) (*instructor consent; may be repeated for up to 4 units)

BIOL 503: Modern Molecular Biology & Genomics (4) (*BIOL 351 or BIOT 355)

BIOL 504: Virology (3) (*BIOL 351 or BIOT 355)

BIOT 420: Plant Biotechnology (3) (*BIOL 351 or BIOT 355)

BIOT 497: Internship in Biotechnology (4) (*instructor consent)

BIOT 498: Stem-Cell Internship (12) (*BIOL 210, 211 and instructor consent; www.csusm.edu/biotechnology/StemCell)

CHEM 351L: Biochemistry Laboratory (2) (*CHEM 341 or 351)

CHEM 352: Biochemistry II (3) (*CHEM 351; **spring only**)

CHEM 450: Protein Structure and Function (3) (*CHEM 341 or 351; **spring only**)

MGMT 452[^]: Leadership in Organizations (4) (*MGMT 302 or 305)

MIS 302[^]: Foundations of Management Info Systems (4) (*ACCT 201, 202 and MATH 132)

MIS 308[^]: Enterprise Systems (4) (*MIS 302 or 304)

OM 305^{^,SCM}: Operations Management (4) (*BIOL 215 and junior standing)

OM 406^{^,SCM}: Decision Models (4) (*BUS 322 or 324 and junior standing)

OM 428^{^,SCM}: Supply Chain Management (4) (*BIOL 215 and junior standing)

OM 441^{^,SCM}: Business Logistics Management (4) (*BIOL 215 and junior standing)

OM 442^{^,SCM}: Procurement and Supplier Management (2) (*BIOL 215 and junior standing)

Need ☒

Course	Units	Sem	Grade