

MOLECULAR SYNTHESIS (CH36)

Major Requirements for the **MOLECULAR SYNTHESIS** B.S. Degree Starting Fall 2024 and After

The Molecular Synthesis major offers a thorough training in all aspects of the molecular synthesis of organic, inorganic, and biological substances, along with a fundamental understanding of their structure and reactivity. This major provides an excellent preparation for employment in biotechnology, diagnostic, electronic, and pharmaceutical enterprises as well as for graduate programs in organic, bioorganic, and inorganic chemistry.

The following courses must be taken for a letter grade:

Lower Division Requirements:

- General Chemistry** (CHEM 6A, 6B & 6C or 6AH, 6BH & 6CH)
- General Chemistry Lab** (CHEM 7L or 7LM)
- Physics** (PHYS 2A, 2B & 2C or 2D)
- Physics Lab** (PHYS 2BL or 2CL or 2DL)
- Calculus** (MATH 20A, 20B, 20C & 20D)
- Linear Algebra** (MATH 18)
- Organic Chemistry** (CHEM 41A, 41B & 41C)
- Organic Chemistry Lab** (CHEM 43A)

Upper Division Requirements:

- 1. Physical Chemistry** (CHEM 126A & 126B recommended; CHEM 130, 131 & 132 acceptable)
- 2. Inorganic Chemistry** (CHEM 120A & 120B)
- 3. Biochemistry** (CHEM 114A)
- 4. Required Laboratory Courses:**
 - a. Analytical Chemistry Laboratory (CHEM 100A)
 - b. Organic Chemistry Laboratory II (CHEM 143B)
 - c. Physical Chemistry Laboratory (CHEM 105A)
 - d. Select 2 additional labs from the following:
 - i. Advanced Inorganic Chemistry Laboratory (CHEM 123)
 - ii. Advanced Organic Chemistry Laboratory (CHEM 143C)
 - iii. Molecular Design and Synthesis Laboratory (CHEM 143D)
- 5. Synthetic Methods** (CHEM 152)
- 6. Structural or Mechanistic Organic Chemistry** (CHEM 154 or CHEM 156)
- 7. Bioorganic or Bioinorganic Chemistry** (CHEM 125 or CHEM 157)
- 8. One Additional Elective:**
 - a. Biochemical Energetics and Metabolism (CHEM 114B)
 - b. Biosynthesis of Macromolecules (CHEM 114C)
 - c. Synthesis of Complex Molecules (CHEM 155)
 - d. Introduction to Computational Chemistry (CHEM 185)
 - e. 4-units of CHEM 199 may be petitioned.

Sample 4-year Academic Plan for Molecular Synthesis B.S. Major

FALL	WINTER	SPRING
FIRST YEAR		
CHEM 6A	CHEM 6B	CHEM 6C
MATH 20A	MATH 20B	MATH 20C
		CHEM 7LM or 7L
SECOND YEAR		
CHEM 41A	CHEM 41B	CHEM 41C
MATH 18	CHEM 43A	PHYS 2C or 2D
PHYS 2A	PHYS 2B	PHYS 2BL or 2CL or 2DL
		MATH 20D
THIRD YEAR		
CHEM 120A	CHEM 120B	CHEM 156 (see notes below)
CHEM 114A	CHEM 100A	CHEM 143B
FOURTH YEAR		
CHEM 126A	CHEM 126B	CHEM 123 (see notes below)
CHEM 152	CHEM 105A	CHEM 157 (see notes below)
CHEM 143C (see notes below)	Molecular Synthesis Elective (see notes below)	

Important Notes:

- Courses listed above only include **major requirements**. Speak with your college advisor for planning completion of general education and university requirements.
- Lab courses are **bolded**. We do not recommend taking a lab your first quarter at UCSD or taking more than one lab/quarter, with the exception of Physics labs.
- No more than one (1) "D" grade is allowed in upper-division major coursework.
- A minimum 2.0 major GPA is required for graduation.
- You have multiple options for fulfilling many of your upper-division requirements with this major. The plan above considers Course Offerings but is only a sample plan. Please refer to the Course Offerings page on our website and the course catalog if you wish to adjust.
- You must complete two of the following labs: CHEM 123, 143C, and 143D. CHEM 123 enrollment is prioritized for graduating CH36 seniors.
- Molecular Synthesis Elective is chosen from CHEM 114B, 114C, 155, or 185. 4 units of CHEM 199 may be petitioned to fulfill this requirement.
- The plan above is meant to be a recommendation and guiding tool; this is not the only path to graduation in four years. Please reach out to the Advising Team if you ever have any questions or concerns.