

# MOLECULAR SYNTHESIS (CH36)

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

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 2-year Academic Plan for Molecular Synthesis B.S. Major

This plan assumes completion of <b>Preparatory</b> course requirements prior to transferring to UCSD.	FALL	WINTER	SPRING
	THIRD YEAR – 1 <sup>ST</sup> YEAR TRANSFER		
	MATH 20C	MATH 18	<b>CHEM 143B</b>
	CHEM 114A	PHYS 2C or 2D	CHEM 156 (See Note)
	CHEM 120A	<b>*PHYS 2BL or 2CL or 2DL</b>	CHEM 120B
		<b>CHEM 100A</b>	MATH 20D
	FOURTH YEAR – 2 <sup>ND</sup> YEAR TRANSFER		
	CHEM 126A	CHEM 126B	<b>CHEM 123</b>
	CHEM 152	<b>CHEM 105A</b>	CHEM 125 or 157
	<b>CHEM 143C</b> (See Note)	CHEM 114B, 114C, 155, OR 185	

FALL	WINTER	SPRING	This plan assumes completion of <b>ALL</b> lower division requirements prior to transferring to UCSD.
THIRD YEAR – 1 <sup>ST</sup> YEAR TRANSFER			
CHEM 120A	CHEM 120B	<b>CHEM 143B</b>	
CHEM 114A	<b>CHEM 100A</b>	CHEM 156 (See Note)	
	CHEM 126A	CHEM 126B	
FOURTH YEAR – 2 <sup>ND</sup> YEAR TRANSFER			
CHEM 152	CHEM 154 or 156	<b>CHEM 123</b> (See Note)	
<b>CHEM 143C</b> (See Note)	<b>CHEM 105A</b>	CHEM 125 or 157	
	CHEM 114B, 114C, 155, OR 185		

### Important Notes:

- We do not recommend taking a chemistry lab your first quarter at UCSD or taking more than one lab a quarter. \*We have placed PHYS lab on top of a CHEM lab only because the PHYS labs are less than 4 units.
- The plans above do not include GE/University requirements.
- A minimum 2.0 major GPA is required for graduation.
- **No more than one "D" grade** is allowed in **upper-division** coursework.
- Many courses have enforced prerequisites or are only offered once per year. It is your responsibility to know which prerequisites are needed for each (course catalog).
- **Molecular Synthesis Requirements:** You have multiple options to fulfill some of your molecular synthesis core classes- the plan above considers course offerings but is only a sample plan. Please refer to our course offerings page and the course catalog if you wish to adjust this plan. Refer to the front page for full list.
- **Molecular Synthesis Labs:** Complete 2 of the following labs: CHEM 123, 143C or 143D. CHEM 123 enrollment is prioritized for graduating CH36 seniors.
- **Additional Elective:** Chosen from CHEM 114B, 114C, 155 or 185.
  - 4 units of CHEM 199 may be [petitioned](#) to fulfill one elective