MOLECULAR SYNTHESIS (CH36)

Major Requirements for the MOLECULAR SYNTHESIS B.S. Degree
Starting Fall 2022 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)
- **Organic Chemistry** (CHEM 41A, 41B & 41C)
- **Organic Chemistry Lab** (CHEM 43A)
- **General Biology** (BILD 1 and BILD 2)

### 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.

Majors sheets for students who entered prior to Fall 2017 can be found on our website: http://chem-web.ucsd.edu/undergraduate/majors-minor/
# Sample 2-year Academic Plan for Molecular Synthesis B.S. Major

This plan assumes completion of **Preparatory** course requirements prior to transferring to UCSD.

<table>
<thead>
<tr>
<th>FALL</th>
<th>WINTER</th>
<th>SPRING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THIRD YEAR – 1ST YEAR TRANSFER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 120A</td>
<td>CHEM 120B</td>
<td>CHEM 100A</td>
</tr>
<tr>
<td>MATH 20C</td>
<td>MATH 20D</td>
<td>Additional Elective</td>
</tr>
<tr>
<td>PHYS 2C or 2D</td>
<td>CHEM 143B</td>
<td></td>
</tr>
<tr>
<td>PHYS 2BL or 2CL or 2DL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FOURTH YEAR – 2ND YEAR TRANSFER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHEM 126A</td>
<td>CHEM 126B</td>
<td>Lab Elective</td>
</tr>
<tr>
<td>CHEM 114A</td>
<td>CHEM 105A</td>
<td>CHEM 125 or 157</td>
</tr>
<tr>
<td>CHEM 152</td>
<td>CHEM 154 or 156</td>
<td></td>
</tr>
<tr>
<td>Lab Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Important Notes:**

- The plans above do not include GE/University requirements or courses required for ASC Certification.
- We do not recommend taking a lab your first quarter at UCSD and taking more than one lab per quarter.
- No more than one "D" grade is allowed in upper-division coursework. A "C-" grade is considered passing.