Examples of Four-Year Plans for Chemistry Majors at Lewis & Clark

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1. Standard plans:

(a) Early start in Science

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
</table>
| 1    | General Chemistry I (CHEM 110)¹  
Calculus I (MATH 131)  
Words or Numbers (CORE 120 or 121)  
Elective | General Chemistry II (CHEM 120)¹  
Calculus II (MATH 132)  
Words or Numbers (CORE 120 or 121)  
Elective |
| 2    | Organic Chemistry I (CHEM 210)¹  
General Physics I (PHYS 141 or 151)²  
Elective  
Elective | Organic Chemistry II (CHEM 220)¹  
General Physics II (PHYS 142)²  
Elective  
Elective |
| 3    | Physical Chemistry (CHEM 320)  
Inorganic Chemistry Lab (CHEM 366)  
Elective  
Elective | Physical Chemistry (CHEM 310)  
Physical & Analytical Chemistry Lab (CHEM 365)  
Elective  
Elective |
| 4    | Chemistry Seminar (CHEM 405)  
Research (CHEM 480 or 490; optional)  
Chemistry Elective³  
Elective | Advanced Inorganic Chemistry (CHEM 420)  
Chemistry Elective³  
Research (CHEM 480 or 490; optional)  
Elective |

(b) Later start in Science

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
</table>
| 1    | Foundations in Quantitative Reasoning (QR 101)⁴  
Words or Numbers (CORE 120 or 121)  
Elective  
Elective | Elementary Functions (MATH 115)⁴  
Words or Numbers (CORE 120 or 121)  
Elective  
Elective |
| 2    | General Chemistry I (CHEM 110)¹  
Calculus I (MATH 131)  
Elective  
Elective | General Chemistry II (CHEM 120)¹  
Calculus II (MATH 132)  
Elective  
Elective |
| 3    | Organic Chemistry I (CHEM 210)¹  
General Physics I (PHYS 141 or 151)²  
Elective  
Elective | Organic Chemistry II (CHEM 220)¹  
General Physics II (PHYS 142)²  
Elective  
Elective |
| 4    | Inorganic Chemistry Lab (CHEM 366)  
Physical Chemistry (CHEM 320)  
Chemistry Seminar (CHEM 405)  
Chemistry Elective³ | Physical Chemistry (CHEM 310)  
Physical & Analytical Chemistry Lab (CHEM 365)  
Advanced Inorganic Chemistry (CHEM 420)  
Chemistry Elective³ |

¹ This course includes a laboratory that meets once a week.
² If taking the alternative PHYS 151/152 sequence, then PHYS 251, a Fall course, is also required.
³ Chemistry electives may be taken in the third or fourth years, either as a single four-credit course or as two two-credit courses. Please see the College Catalog for a list of eligible courses.
⁴ The sequence QR 101/MATH 115 is needed if ALEKS scores are not sufficiently high for placement in CHEM 110, PHYS 141 (or 151), and MATH 131.
2. Plans for pre-health students:

(a) Early start in Science

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
</table>
| 1    | General Chemistry I (CHEM 110)\(^1\)  
Calculus I (MATH 131)  
Words or Numbers (CORE 120 or 121) Elective | General Chemistry II (CHEM 120)\(^1\)  
Calculus II (MATH 132)  
Biological Investigations (BIO 110)\(^2\)  
Words or Numbers (CORE 120 or 121) Elective |
| 2    | Organic Chemistry I (CHEM 210)\(^1\)  
General Physics I (PHYS 141 or 151)\(^2\)  
Biological Core Concepts: Mechanism (BIO 201)\(^6\) Elective | Organic Chemistry II (CHEM 220)\(^1\)  
General Physics II (PHYS 142)\(^2\)  
Biology Elective\(^7\) Elective |
| 3    | Physical Chemistry (CHEM 320)  
Inorganic Chemistry Lab (CHEM 366)  
Structural Biochemistry (CHEM 330)\(^9\) Elective | Physical Chemistry (CHEM 310)  
Physical & Analytical Chemistry Lab (CHEM 365)  
Elective Elective |
| 4    | Chemistry Seminar (CHEM 405)  
Research (CHEM 480 or 490; optional)  
Chemistry Elective\(^3,9\) Elective | Advanced Inorganic Chemistry (CHEM 420)  
Chemistry Elective\(^3\)  
Research (CHEM 480 or 490; optional)  
Chemistry Elective\(^3,9\) |

(b) Later start in Science

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
</table>
| 1    | Foundations in Quantitative Reasoning (QR 101)\(^8\)  
Words or Numbers (CORE 120 or 121) Elective | Biological Investigations (BIO 110)  
Elementary Functions (MATH 115)\(^4\)  
Words or Numbers (CORE 120 or 121) Elective |
| 2    | General Chemistry (Chem 110)\(^1\)  
Calculus I (Math 131)  
Biological Core Concepts: Mechanism (BIO 201)\(^6\) Elective | General Chemistry (Chem 120)\(^1\)  
Calculus II (Math 132)  
Biology Elective\(^7\) Elective |
| 3    | Organic Chemistry I (CHEM 210)\(^1\)  
General Physics I (PHYS 141 or 151)\(^2\) Elective | Organic Chemistry II (CHEM 220)\(^1\)  
General Physics II (PHYS 142)\(^2\) Elective Elective |
| 4    | Inorganic Chemistry Lab (CHEM 366)  
Physical Chemistry (CHEM 320)  
Chemistry Seminar (CHEM 405)  
Structural Biochemistry (CHEM 330)\(^9\) | Advanced Inorganic Chemistry (CHEM 420)  
Chemistry Elective\(^3\)  
Research (CHEM 480 or 490; optional)  
Chemistry Elective\(^3,9\) |

\(^1\) Can also be taken in the Fall semester  
\(^2\) Can also be taken in the Spring semester  
\(^7\) A second 200 level or higher biology elective is required by some medical programs; contact the pre-health advisor for more details  
\(^8\) A Biochemistry course provides a good foundation for the MCAT. Metabolic Biochemistry (CHEM 335), a Spring course, is also an option.  
\(^9\) If Structural or Metabolic Biochemistry is taken, this counts as the chemistry elective
3. Plans with overseas programs:

(a) Spring overseas program

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Chemistry I (CHEM 110)(^1) Calculus I (MATH 131) Words or Numbers (CORE 120 or 121) Elective</td>
<td>General Chemistry II (CHEM 120)(^1) Calculus II (MATH 132) Words or Numbers (CORE 120 or 121) Elective</td>
</tr>
<tr>
<td>2</td>
<td>Organic Chemistry I (CHEM 210)(^1) General Physics I (PHYS 141 or 151)(^{1,2}) Elective Elective</td>
<td>Organic Chemistry II (CHEM 220)(^1) General Physics II (PHYS 142)(^{1,2}) Elective Elective</td>
</tr>
<tr>
<td>3</td>
<td>Physical Chemistry (CHEM 320) Inorganic Chemistry Lab (CHEM 366) Chemistry Elective(^5) Elective</td>
<td>Overseas Program</td>
</tr>
<tr>
<td>4</td>
<td>Chemistry Seminar (CHEM 405) Research (CHEM 480 or 490; optional) Chemistry Elective(^6) Elective</td>
<td>Physical Chemistry (CHEM 310) Physical &amp; Analytical Chemistry Lab (CHEM 365) Advanced Inorganic Chemistry (CHEM 420) Research (CHEM 480 or 490; optional)</td>
</tr>
</tbody>
</table>

(b) Fall overseas program

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Chemistry I (CHEM 110)(^1) Calculus I (MATH 131) Words or Numbers (CORE 120 or 121) Elective</td>
<td>General Chemistry II (CHEM 120)(^1) Calculus II (MATH 132) Words or Numbers (CORE 120 or 121) Elective</td>
</tr>
<tr>
<td>2</td>
<td>Organic Chemistry I (CHEM 210)(^1) General Physics I (PHYS 141 or 151)(^{1,2}) Elective Elective</td>
<td>Organic Chemistry II (CHEM 220)(^1) General Physics II (PHYS 142)(^{1,2}) Elective Elective</td>
</tr>
<tr>
<td>3</td>
<td>Overseas Program</td>
<td></td>
</tr>
</tbody>
</table>
4. Plan for an American Chemical Society certified major

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Chemistry (Chem 110)&lt;sup&gt;i&lt;/sup&gt;</td>
<td>General Chemistry (Chem 120)&lt;sup&gt;i&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Calculus I (Math 131)</td>
<td>Calculus II (Math 132)</td>
</tr>
<tr>
<td></td>
<td>Exploration &amp; Discovery</td>
<td>Exploration &amp; Discovery</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>2</td>
<td>Organic Chemistry I (CHEM 210)&lt;sup&gt;i&lt;/sup&gt;</td>
<td>Organic Chemistry II (CHEM 220)&lt;sup&gt;i&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>General Physics I (PHYS 141 or 151)&lt;sup&gt;1,2&lt;/sup&gt;</td>
<td>General Physics II (PHYS 142)&lt;sup&gt;1,2&lt;/sup&gt;</td>
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<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
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<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
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<tr>
<td>3</td>
<td>Physical Chemistry (CHEM 320)</td>
<td>Physical Chemistry (CHEM 310)</td>
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<tr>
<td></td>
<td>Inorganic Chemistry Lab (CHEM 366)</td>
<td>Physical &amp; Analytical Chemistry Lab (CHEM 365)</td>
</tr>
<tr>
<td></td>
<td>Chemistry Elective&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Experimental Methods (PHYS 201)</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
</tr>
<tr>
<td>4</td>
<td>Chemistry Seminar (CHEM 405)</td>
<td>Advanced Inorganic Chemistry (CHEM 420)</td>
</tr>
<tr>
<td></td>
<td>Structural Biochemistry (CHEM 330)&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Research (CHEM 480 or 490; optional)</td>
</tr>
<tr>
<td></td>
<td>Research (CHEM 480 or 490; optional)</td>
<td>Chemistry elective&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Elective</td>
<td>Elective</td>
</tr>
</tbody>
</table>

<sup>10</sup> Metabolic Biochemistry (CHEM 335), a Spring course, is also an option