# John Carroll University Chemistry Study Plan

## Chemistry Major with Concentration in Chemical Physics, 5th year MBA

### 1st yr

<table>
<thead>
<tr>
<th>Fall</th>
<th>18 cr total</th>
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</thead>
<tbody>
<tr>
<td>4 cr CH141 General Chemistry I</td>
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</tr>
<tr>
<td>1 cr CH143 General Chemistry Laboratory I</td>
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</tr>
<tr>
<td>4 cr MT135 Calculus and Analytic Geometry I</td>
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</tr>
<tr>
<td>3 cr EN125</td>
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<tr>
<td>3 cr CO125</td>
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<tr>
<td>3 cr TRS Course</td>
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<table>
<thead>
<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>4 cr CH142 General Chemistry II</td>
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<tr>
<td>1 cr CH144 General Chemistry Laboratory II</td>
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</tr>
<tr>
<td>4 cr MT135 Calculus &amp; Analytic Geometry II</td>
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<tr>
<td>3 cr Engaging the Global Community</td>
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<tr>
<td>3 cr Social Justice Requirement</td>
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<tr>
<td>3 cr PLKR Course</td>
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### 2nd yr

<table>
<thead>
<tr>
<th>Fall</th>
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<tbody>
<tr>
<td>3 cr CH221 Organic Chemistry I</td>
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<tr>
<td>1 cr CH223 Organic Chemistry Laboratory I</td>
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<tr>
<td>3 cr MT233 Calculus &amp; Analytic Geometry III</td>
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<tr>
<td>4 cr PH135 Physics I</td>
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<tr>
<td>1 cr PH135L Physics Workshop I</td>
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<tr>
<td><strong>3 cr B1100</strong></td>
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<tr>
<td>3 cr PLVS Course</td>
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<tbody>
<tr>
<td>3 cr CH222 Organic Chemistry II</td>
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<tr>
<td>1 cr CH224 Organic Chemistry Laboratory II</td>
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<tr>
<td>3 cr CH261 Analytical Chemistry (QA)</td>
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<tr>
<td>1 cr CH263 Analytical Chemistry Laboratory</td>
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<tr>
<td>4 cr PH136 Physics II</td>
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<tr>
<td>1 cr PH136L Physics Workshop II</td>
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<tr>
<td><strong>3 cr EC221 Fundamentals of Economics</strong></td>
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### 3rd yr

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<tbody>
<tr>
<td>3 cr CH365 Physical Chemistry I</td>
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<tr>
<td>2 cr CH367 Physical Chemistry Laboratory I</td>
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<tr>
<td>1 cr CH399A Undergraduate Research</td>
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<tr>
<td>0 cr CH478A Chemistry Seminar</td>
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<tr>
<td>3 cr PH246 Modern Physics</td>
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<tr>
<td><strong>3 cr AC221 Fundamentals of Accounting</strong></td>
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<tr>
<td>3 cr Introduction to Humanities</td>
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<tr>
<td>3 cr Introduction to Social Sciences</td>
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<table>
<thead>
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<th>Spring</th>
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<tbody>
<tr>
<td>3 cr CH366 Physical Chemistry II</td>
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<tr>
<td>1 cr CH368 Physical Chemistry Laboratory II</td>
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<tr>
<td>1 cr CH399A Undergraduate Research</td>
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<tr>
<td>4 cr CH431 General Biochemistry</td>
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<tr>
<td>0 cr CH478B Chemistry Seminar</td>
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<tr>
<td>3 cr EP217 Mathematical Methods of Physics and Engineering</td>
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<tr>
<td><strong>3 cr MN325 Organizational Behavior and Management</strong></td>
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<tr>
<td>3 cr TRS Course</td>
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### 4th yr

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<tbody>
<tr>
<td>3 cr CH441 Instrumental Analysis</td>
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<td>2 cr CH443 Instrumental Analysis Laboratory*</td>
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<tr>
<td>3 cr CH495 Special topics</td>
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<tr>
<td>1 cr CH399A Undergraduate Research</td>
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<tr>
<td><strong>3 cr MK301 Marketing Principles</strong></td>
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<tr>
<td>3 cr Foreign Language Requirement</td>
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<table>
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<tr>
<th>Spring</th>
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<tbody>
<tr>
<td>3 cr CH481 Inorganic Chemistry</td>
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<tr>
<td>1 cr CH482 Inorganic Chemistry Laboratory</td>
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<tr>
<td>6 cr Linked Pair of Courses</td>
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<tr>
<td>1 cr Creative Arts Requirement</td>
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<tr>
<td><strong>3 cr FN312 Business Finance</strong></td>
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<tr>
<td>3 cr Foreign Language Requirement</td>
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**Required by JCU major**  
Elective or required by JCU core

Very Strong Students should be encouraged to take PH135/135L during their freshman year and postpone their CO125 and Social Justice courses till their sophomore year.

Weaker students should be encouraged to take MT133 and MT134 during their freshman year and take MT136 and MT233 during their sophomore year and postpone the Language Requirement until their junior or senior years.

Students may complete CH 435 and CH 436 in place of CH 431 and one upper division elective.

The combinations of CH366 & CH368 and CH481 & CH482 may be interchanged.

*CH443 will satisfy the Core Requirements for Capstone, Advanced Writing within the major and Oral Presentation within the major.