# Cleveland State University <br> College of Arts and Sciences <br> Bachelor of Science in Chemistry <br> (American Chemical Society Certified Track) 

| First Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 261/266 General Chemistry I/Lab | 4 | X | NS | CHM 262/267 General Chemistry II/Lab | 4 | x | NS |
| MTH 181 Calculus I | 4 | x | M/QL | MTH 182 Calculus II | 4 | X | M/QL |
| ENG 101 English I | 3 |  | w/c | ENG 102 English II | 3 |  | w/c |
| ASC 101 Introduction to University Life | 1 |  | INTRO | Arts \& Humanities Elective** | 3 |  | A\&H |
| Social Science Elective** | 3 |  | SS |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Semester Total | 15 |  |  | Semester Total | 14 |  |  |


| Second Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 331/336 Organic Chemistry 1/Lab | 4 | x |  | CHM 332/337 Organic Chemistry II/Lab | 4 | x |  |
| MTH 281 Multivariable Calculus | 4 | x |  | PHY 242 University Physics II (or PHY 244) | 5 | X | NS |
| PHY 241 University Physics I (or PHY 243) | 5 | X | NS | CHM 301 Research Methods in Chemistry | 2 | x | WAC |
| General Elective* | 3 |  |  | US Diversity Elective | 3 |  | DIV |
|  |  |  |  |  |  |  |  |
| Semester Total | 16 |  |  | Semester Total | 14 |  |  |


| Third Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 321 Physical Chemistry I | 3 | x |  | CHM 322 Physical Chemistry II | 3 | X |  |
| CHM 311 Analytical Chemistry | 3 | x |  | CHM 412 Advanced Instrumental Analysis | 3 | X |  |
| CHM 316 Analytical Chemistry Lab | 2 | x |  | CHM 416 Instrumental Analysis Lab | 3 | x | WAC |
| CHM 411 Insrumental Analysis | 3 | x |  | CHM 431 Advanced Organic Chemistry | 2 | x |  |
| CHM 426 Physical Chemistry Lab I | 3 | x | WAC | CHM 427 Physical Chemistry Lab II | 3 | x |  |
|  |  |  |  | CHM Elective (300/400 level) | 3 | X |  |
| Semester Total | 14 |  |  | Semester Total | 17 |  |  |


| Fourth Year |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester |  | Credits | Major | Gen Ed |
| CHM 402 Biochemistry I | 3 | x |  | CHM 403 Biochemistry II |  | 3 | x |  |
| CHM 441 Inorganic Chemistry | 3 | x |  | CHM 446 Inorganic Chemisty Lab |  | 2 | x |  |
| CHM 471 Faculty Colloquium | 1 | X |  | CHM 472 Student Colloquium |  | 1 | x | CAP |
| CHM Elective (300/400 level) | 3 | x |  | CHM 489 Senior Research |  | 3 | x |  |
| General Elective* | 2 |  |  | African American Experience |  | 3 |  | DIV |
| Arts \& Humanities Elective** | 3 |  | A\&H | Social Science Elective** |  | 3 |  | Ss |
| Apply for Spring graduation by the middle of this term |  |  |  |  |  |  |  |  |
| Semester Total | 15 |  |  |  | Semester Total | 15 |  |  |
| Degree Total (as listed in above sample): 120 (120 hours minimum required to earn degree) |  |  |  |  |  |  |  |  |

Assumptions: college-level readiness in MTH \& ENG; no Foreign Language Deficiency

## College/ Program Notes

The plan above is a suggested guide to ensure that all General Education, College, University, and Major requirements are met within 4 years of study. Students may deviate from the suggested placement of Gen Ed courses, although the M/QL and W/C requirements should be completed during the first year of study.
*Electives ensure that a student accumulates the minimum credit hour totals needed for graduation. Students must have a minimum of $\mathbf{1 2 0}$ total credit hours, of which a minimum of $\mathbf{4 2}$ credit hours must be upper division ( 300 or 400 -level courses). Depending upon other elective choices made, students may not need as many general electives as indicated above, or may need additional electives.
University Notes:

| Gen Ed Key: | SS = Social Sciences (two courses from different departments**) |
| :--- | :--- |
| INTRO = Introduction to University Life (one course) | A\&H = Arts \& Humanities (two courses from different departments**) |
| W/C = Writing/Composition (two courses; C or better required) | DIV = Social Diversity (two courses; one US Diversity and one African American Experience) |
| M/QL = Mathematics/Quantitative Literacy (two courses) | WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better required) |
| NS = Natural Sciences (two courses, one of which must have a lab) | CAP = Capstone |

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 or any other subject addressed herein.

# Cleveland State University <br> College of Arts and Sciences <br> Bachelor of Science in Chemistry 

(Pre-Professional Track)

| First Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 261/266 General Chemistry 1/Lab | 4 | X | NS | CHM 262/267 General Chemistry II/Lab | 4 | X | NS |
| BIO 200/201 Introductory Biology 1/Lab | 4 | x | NS | B1O 202/203 Introductory Biology II/Lab | 4 | x | NS |
| ENG 101 English I | 3 |  | w/c | ENG 102 English II | 3 |  | w/c |
| ASC 101 Introduction to University Life | 1 |  | INTRO | MTH 181 Calculus I | 4 | x | M/QL |
| STA 147 Statistics | 3 | X | M/QL |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Semester Total | 15 |  |  | Semester Total | 15 |  |  |


| Second Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 331/336 Organic Chemistry 1/Lab | 4 | X |  | CHM 332/337 Organic Chemistry II/Lab | 4 | X |  |
| Arts \& Humanities Elective** | 3 |  | A\&H | Social Science Elective** | 3 |  | SS |
| PHY 221 College Physics I | 5 | x | NS | PHY 222 College Physics II | 5 | x | NS |
| General electiv** | 2 |  |  | CHM 301 Research Methods in Chemistry | 2 | X | WAC |
|  |  |  |  |  |  |  |  |
| Semester Total | 14 |  |  | Semester Total | 14 |  |  |


| Third Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| Arts \& Humanities Elective ** | 3 |  | A\&H | BIO 310/311 Genetics \& Recitation | 4 | X |  |
| CHM 310 Survey Analytical Chemistry | 2 | x |  | CHM 320 Survey of Physical Chemistry | 3 | X |  |
| CHM 315 Survey Analytical Chemistry Lab | 2 | x |  | CHM 403 Biochemistry II | 3 | x |  |
| CHM 402 Biochemistry I | 3 | X |  | Social Science Elective** | 3 |  | SS |
| BIO 308/309 Cell Biology/Lab | 4 | X |  | Writing Across the Curriculum Elective | 3 |  | WAC |
|  |  |  |  |  |  |  |  |
| Semester Total | 14 |  |  | Semester Total | 16 |  |  |


| Fourth Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 471 Faculty Colloquium | 1 | x |  | CHM 472 Student Colloquium | 1 | X | CAP |
| BIO 416/417 Microbiology/Lab | 5 | X |  | CHM/BIO Elective (300/400 level) | 3 | x |  |
| CHM/BIO Elective (300/400 level) | 3 | X |  | African American Experience Elective | 3 |  | DIV |
| BIO 302/303 Animal Biology/Lab | 4 | X |  | US Diversity Elective | 3 |  | DIV |
| CHM/BIO Elective (300/400 level) | 3 | x |  | Writing Across the Curriculum Elective | 3 |  | WAC |
|  |  |  |  | CHM/BIO Elective (300/400 level) | 3 | X |  |
| Apply for Spring graduation by the middle of this term |  |  |  |  |  |  |  |
| Semester Total | 16 |  |  | Semester Total | 16 |  |  |
| Degree Total (as listed in above sample): 120 (120 hours minimum required to earn degree) |  |  |  |  |  |  |  |

Assumptions: college-level readiness in MTH \& ENG; no Foreign Language Deficiency

## College/ Program Notes:

The plan above is a suggested guide to ensure that all General Education, College, University, and Major requirements are met within 4 years of study. Students may deviate from the suggested placement of Gen Ed courses, although the M/QL and W/C requirements should be completed during the first year of study.
*Electives ensure that a student accumulates the minimum credit hour totals needed for graduation. Students must have a minimum of $\mathbf{1 2 0}$ total credit hours, of which a minimum of $\mathbf{4 2}$ credit hours must be upper division ( 300 or 400 -level courses). Depending upon other elective choices made, students may not need as many general electives as indicated above, or may need additional electives.

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# Cleveland State University <br> College of Arts and Sciences <br> Bachelor of Science in Chemistry <br> (Pre-Professional Track with Concentration in Pharmaceutical Science) 

| First Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 261/266 General Chemistry 1/Lab | 4 | x | NS | CHM 262/267 General Chemistry II/Lab | 4 | X | NS |
| BIO 200/201 Introductory Biology 1/Lab | 4 | x | NS | BIO 202/203 Introductory Biology II/Lab | 4 | x | NS |
| ENG 101 English I | 3 |  | w/c | ENG 102 English II | 3 |  | w/c |
| ASC 101 Introduction to University Life | 1 |  | INTRO | MTH 181 Calculus I | 4 | x | M/QL |
| STA 147 Statistics | 3 | x | M/QL |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Semester Total | 15 |  |  | Semester Total | 15 |  |  |


| Second Year |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester | Credits | Major | Gen Ed |
| CHM 331/336 Organic Chemistry I/Lab | 4 | x |  | CHM 332/337 Organic Chemistry II/Lab | 4 | x |  |
| Social Science Elective** | 3 |  | SS | Arts \& Humanities Elective** | 3 |  | A\&H |
| PHY 221 College Physics I | 5 | x | NS | PHY 222 College Physics II | 5 | x | NS |
| US Diversity Elective | 3 |  | DIV | Writing Across the Curriculum Elective | 3 |  | WAC |
|  |  |  |  |  |  |  |  |
| Semester Total | 15 |  |  | Semester Total | 15 |  |  |

Third Year

| Third Year |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester |  | Credits | Major | Gen Ed |
| CHM 341 Pharmacology I | 3 | x |  | CHM 342 Pharmacology II |  | 3 | x |  |
| CHM 351 Medicinal Chemistry I | 3 | X |  | CHM 352 Medicinal Chemistry II |  | 3 | x |  |
| CHM 310 Survey Analytical Chemistry | 2 | x |  | BIO 310/311 Genetics and Recitation |  | 4 | x |  |
| CHM 315 Survey Analytical Chemistry Lab | 2 | X |  | CHM 403 Biochemistry II |  | 3 | x |  |
| CHM 402 Biochemistry I | 3 | X |  |  |  |  |  |  |
| Social Science Elective** | 3 |  | ss |  |  |  |  |  |
| Semester Total | 16 |  |  |  | Semester Total | 13 |  |  |


| Fourth Year |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | Gen Ed | Spring Semester |  | Credits | Major | Gen Ed |
| BIO 416/417 Microbiology/Lab | 5 | x |  | African American Experience Elective |  | 3 |  | DIV |
| CHM 455 Biotechnology Techniques | 3 | x |  | CHM 471 Faculty Colloquium |  | 1 | x |  |
| CHM 457 Pharmaceutical Analysis Lab | 3 | x | CAP | CHM 472 Student Colloquium |  | 1 | x | CAP |
| CHM/BIO Elective ( $300 / 400$ level) ${ }^{\wedge}$ | 3 | X |  | CHM/BIO Elective ( $300 / 400$ level) ${ }^{\wedge}$ |  | 3 | X |  |
| Writing Across the Curriculum Elective | 3 |  | WAC | CHM/BIO Elective ( $300 / 400$ level)^ |  | 3 | x |  |
|  |  |  |  | Arts \& Humanities Elective** |  | 3 |  | A\&H |
| Apply for Spring graduation by the middle of this term |  |  |  |  |  |  |  |  |
| Semester Total | 17 |  |  |  | Semester Total | 14 |  |  |
| Degree Total (as listed in above sample): 120 (120 hours minimum required to earn degree) |  |  |  |  |  |  |  |  |

Assumptions: college-level readiness in MTH \& ENG; no Foreign Language Deficiency

## College/ Program Notes

 although the M/QL and W/C requirements should be completed during the first year of study.
 ( 300 or 400 -level courses). Depending upon other elective choices made, students may not need as many general electives as indicated above, or may need additional electives.
${ }^{\wedge}$ One of the CHM/BIO 300/400 level electives MUST also be an approved WAC course in order to satisfy the WAC-in-major requirement.

## University Notes:

| Gen Ed Key: | SS = Social Sciences (two courses from different departments**) |
| :--- | :--- |
| INTRO = Introduction to University Life (one course) | A\&H = Arts \& Humanities (two courses from different departments**) |
| W/C = Writing/Composition (two courses; C or better required) | DIV = Social Diversity (two courses; one US Diversity and one African American Experience) |
| M/QL = Mathematics/Quantitative Literacy (two courses) | WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better required) |
| NS = Natural Sciences (two courses, one of which must have lab) |  |
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|  |  |
|  |  |

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## Cleveland State University

## College of Arts and Sciences

Bachelor of Science in Chemistry
CSUteach (license in Education)


| Second Year |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | License | Gen Ed | Spring Semester | Credits | Major | License | Gen Ed |
| EUT 201: Step 1: Inquiry Approaches to Teaching | 1 |  | x |  | EDB 242: Introduction to Education | 3 |  | x | DIV |
| CHM 331/336: Organic Chemistry I + Lab | 4 | x |  |  | CHM 332/337: Organic Chemistry II + Lab | 4 | x |  |  |
| BIO 202/203: Introductory Biology II + Lab | 4 | x |  | NS | BIO 304/305: Population Biology \& Ecology + Lab | 4 | x |  |  |
| EVS 206: Intro to Environmental Science | 3 | x |  | NS | STA 147: Statistical Concepts \& App | 3 | x |  | M/QL |
| Arts \& Humanities Elective (**ALAAME) | 3 |  |  | A\&H | EDC 200: Div in Edu Settings | 3 |  | x | DIV |
| African American Experience Elective | 3 |  |  | DIV |  |  |  |  |  |
| Semester Total | 18 |  |  |  | Semester Total | 17 |  |  |  |


| Third Year |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | License | Gen Ed | Spring Semester |  | Credits | Major | License | Gen Ed |
| EDB 302: Psychological Foundations of Education | 3 |  | x | WAC | EUT 305: Classroom Interactions |  | 3 |  | x |  |
| CHM 310/315: Survey of Analytical Chem + lab | 4 | x |  |  | PHY 201: Astronomy: Stars \& Galaxies |  | 3 | x |  | NS |
| PHY 221: College Physics I | 5 | x |  | NS | PHY 222: College Physics II |  | 5 | x |  | NS |
| GEO 100/101: Intro to Geology + Lab | 4 | $x$ |  | NS | ESE 400: Introduction to Education |  | 3 |  | x | WAC |
| CHM 404: Environmental Chemistry | 3 | x |  |  | Social Science Elective (**ALAAME) |  | 3 | x |  | SS |
|  |  |  |  |  |  |  |  |  |  |  |
| Semester Total | 19 |  |  |  |  | Semester Total | 17 |  |  |  |


| Fourth Year |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Fall Semester | Credits | Major | License | Gen Ed | Spring Semester | Credits | Major | License | Gen Ed |
| EUT 417: Project Based Instruction in Science | 3 |  | x |  | EST 499: CSUteach STEM Apprentice Teaching II | 6 |  | x |  |
| EST 399: CSUteach STEM Apprentice Teaching I | 1 |  | x |  | EUT 210: Perspectives on Science \& Math | 3 |  | x | A\&H/WAC |
| EUT 311: Research Methods | 3 |  | x | WAC | EDL 305: Content Area Literacy | 3 |  | x |  |
| CHM 402: Biochemistry | 3 | x |  |  |  |  |  |  |  |
| PHY 470: Environmental Physics | 3 | x |  |  |  |  |  |  |  |
| CHM 320: Survey of Physical Chemistry | 3 | x |  |  |  |  |  |  |  |
| CHM 472: Student Colloquium | 1 | x |  | CAP/WAC |  |  |  |  |  |
| Apply for Spring graduation by the middle of this term |  |  |  |  |  |  |  |  |  |
| Semester Total | 17 |  |  |  | Semester Total | 12 |  |  |  |
| Degree Total: 130 |  |  |  |  |  |  |  |  |  |

Assumptions: college-level readiness in MTH \& ENG; no Foreign Language Deficiency

## College/ Program Notes:

The plan above is a suggested guide to ensure that all General Education, College, University, and Major requirements are met within 4 years of study. Students may deviate from the suggested placement of Gen Ed courses, although the M/QL and W/C requirements should be completed during the first year of study.
*Electives ensure that a student accumulates the minimum credit hour totals needed for graduation. Students must have a minimum of $\mathbf{1 2 0}$ total credit hours, of which a minimum of $\mathbf{4 2}$ credit hours must be upper division ( 300 or 400 -level courses). Depending upon other elective choices made ( 3 credit hour vs. 4 credit hour courses), students may not need as many general electives as indicated above, or may need additional electives.

## University Notes:

## Gen Ed Key: $\quad$ SS = Social Sciences (two courses from different departments) <br> INTRO = Introduction to University Life (one course) W/C = Writing/Composition (two courses; C or better required) <br> A\&H = Arts \& Humanities (two courses from different departments <br> DIV = Social Diversity (two courses; one US Diversity and one African American Experience) <br> WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better requir CAP = Capstone <br> M/QL = Mathematics/Quantitative Literacy (two courses)

** of the SS and A\&H courses, one must be focused on Africa, Latin America, Asia or the Middle East (ALAAME)


[^0]:    University Notes:

    | Gen Ed Key: | SS = Social Sciences (two courses from different departments**) |
    | :--- | :--- |
    | INTRO = Introduction to University Life (one course) | A\&H = Arts \& Humanities (two courses from different departments**) |
    | W/C = Writing/Composition (two courses; C or better required) | DIV = Social Diversity (two courses; one US Diversity and one African American Experience) |
    | M/QL = Mathematics/Quantitative Literacy (two courses) | WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better required) |
    | NS = Natural Sciences (two courses, one of which must have a lab) |  |
    | $\quad$ ** of the four total SS and A\&H courses, one must be focused on Africa, Latin America, Asia or the Middle East (ALAAME) |  |

    
     other subject addressed herein.

[^1]:    
     other subject addressed herein.

