

## American Chemical Society Certification

Course Requirements	Laboratory Experience Required
<p><b>Introductory courses</b> CH105-6 or CH107 General Chemistry</p> <p><b>Allied courses</b> MA106-7 Calculus 1&amp;2 PH107-8 or PH201-2 Physics</p> <p><b>Five foundational courses from the following list:</b> CH321 Analytical Chemistry CH331 Inorganic Chemistry CH351 Organic Chemistry 1 CH361 <b>or</b> CH362 Biological Chemistry (<i>cannot count both</i>) CH371 Physical Chemistry</p> <p><b>Four in-depth course from the following list:</b> CH352 Organic Chemistry 2 CH422 Analytical Chemistry 2 CH425 Environmental Chemistry CH431 Advanced Inorganic Chemistry CH451 Advanced Organic Chemistry CH462 Biochemistry 2 CH472 Physical Chemistry 2 CH4x9 Special Topics in Chemistry</p>	<p><b>350 laboratory hours spread across four of the following five areas:</b></p> <ol style="list-style-type: none"> <li>1) Analytical Chemistry courses with labs: CH321 (42/350 lab hours) CH424 (56/350 lab hours)</li> <li>2) Biological Chemistry courses with labs: CH363 (42/350 lab hours) CH463 (56/350 lab hours)</li> <li>3) Inorganic Chemistry courses with labs: CH433 (56/350 lab hours)</li> <li>4) Organic Chemistry courses with labs: CH351 (42/350 lab hours) CH352 (42/350 lab hours) CH453 (56/350 lab hours)</li> <li>5) Physical Chemistry courses with labs: CH473 (56/350 lab hours) (may be repeatable)</li> </ol> <p>Other Laboratory Research (up to 130/350 lab hours): (area depends on expertise of the supervising faculty member) (any research experience from this category must be documented with a final report*) CH493 (42/350 lab hours for each semester enrolled) CH494 (84/350 lab hours for each semester enrolled) Non-credit Summer research**</p>

\*A student using CH493/4 research to meet the ACS-certification requirements must prepare a well written, comprehensive, and well-documented research report, including safety considerations where appropriate. Thorough and current references to peer-reviewed literature play a critical role in establishing the overall scholarship of the report. One report is required per research project (i.e. only one report is required for an ongoing project pursued over multiple semesters). A completed honors thesis can qualify as this report. No presentations (oral, poster) nor journal article co-authorship substitute for the student writing a comprehensive report. Non-thesis reports should be prepared as part of CH411 independent study credit under the faculty mentor.

\*\* Students pursuing Summer research under the direction of a Butler Chemistry and Biochemistry faculty member can fold that research into a CH411 report or honors thesis (CH499). Students pursuing Summer research outside of the department must 1) have a faculty member of the Chemistry and Biochemistry department with subdiscipline-specific expertise certify that the research should count in one of the five fundamental areas defined above. The student should complete either a thesis advised by that faculty member, or complete the above report as part of CH411 under that faculty member.