Biochemistry Major for students matriculating after Aug 1, 2023

	Electives (must complete at least 3 credit hours CH, and another 3 credit hours of CH or BI)	
Strictly Required Courses	**Approved CH electives**	**Approved BI electives**
Required CH courses CH105-6 (8 cr) or CH107 General Chemistry (5 cr) CH160 Modern Issues in Biochemistry (1 cr) CH351-2 Organic Chemistry 1&2 (8 cr) CH321 Analytical Chemistry 1 (4 cr) CH361: Introduction to Biochemistry (3 cr) CH362 Biochemistry 1 (3 cr) CH462 Biochemistry 2 (3 cr) CH464 Experiential Learning in Macromolecular Structure (2 cr) CH363 Biochemistry Laboratory 1 (2 cr) One 400-level CH laboratory course from among the following: CH424, CH433, CH453, CH463, CH473 (3 cr) *Required allied courses* MA106 Calculus 1 (4 cr) BI210 Genetics (4 cr) BI220 Cell Biology (4 cr)	CH331 Inorganic Chemistry (3 cr) CH371 Physical Chemistry (3 cr) *(requires MA107 prerequisite)* CH408 (3 cr) or CH418 (3 cr) *(cannot count both)* CH422 Analytical Chemistry II (3 cr) CH431 Inorganic Chemistry 2 (3 cr) CH451 Advanced Organic Chemistry (3 cr) CH472 Physical Chemistry II (3 cr) CH4x9 ***any*** Special Topics in Chemistry course CH425 Environmental Chemistry (3 cr)	*BI courses with BI220 prerequisite* BI323 Principles of Immunology (2 cr) BI325 Principles of Pathogenic Microbiology (3 cr) *BI courses with BI230 prerequisite* BI411 Principles of Physiology (4 cr) BI432 Plant Physiology (4 cr) BI433 Advanced Cell Biology (4 cr) BI434 Transmission Genetics (4 cr) BI435 Molecular Genetics (4 cr) BI436 Genomics, Bioinformatics, and Gene Evolution (4 cr) BI438 Microbiology (4 cr) BI440 Molecular Virology (4 cr) NS460 (3 cr) or BI460 Cell and Molecular Biology (4 cr) *(cannot count both)*

American Chemical Society Certification

Course Requirements	Laboratory Experience Required
Introductory courses CH105-6 or CH107 General Chemistry Allied courses MA106-7 Calculus 1&2 PH107-8 or PH201-2 Physics Five foundational courses from the following list: CH321 Analytical Chemistry CH331 Inorganic Chemistry CH351 Organic Chemistry 1 CH361 ***or*** CH362 Biological Chemistry (*cannot count both*) CH371 Physical Chemistry Four in-depth course from the following list: 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	350 laboratory hours spread across four of the following five areas: 1) Analytical Chemistry courses with labs: CH321 (42/400 lab hours) CH424 (56/400 lab hours) 2) Biological Chemistry courses with labs: CH363 (42/400 lab hours) CH463 (56/400 lab hours) 3) Inorganic Chemistry courses with labs: CH433 (56/400 lab hours) 4) Organic Chemistry courses with labs: CH351 (42/400 lab hours) CH352 (42/400 lab hours) CH453 (56/400 lab hours) 5) Physical Chemistry courses with labs: CH473 (56/400 lab hours) (may be repeatable) 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 (42/400 lab hours for each semester enrolled) CH494 (84/400 lab hours for each semester enrolled) Non-credit Summer research**

*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.