ACS Certified Degree Requirements at Harvey Mudd College

1. To earn an ACS certified degree, a student must receive instruction that is equivalent to a one-semester course of at least three semester credit hours in each of the five traditional subdisciplines of chemistry. The purpose of the foundation course work is to provide breadth in chemistry by grounding students in the five subdisciplines: analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry.

HMC students meet this requirement by taking Chem 51, 56, 103, 104, and 182.

> ***Chemistry*** *majors are required to take all five foundation courses for graduation.*
>
> ***Joint chemistry-biology*** *majors are required to take Chem 51, 56, 182 and one of 103 or 104 for graduation and should take BOTH 103 AND 104 to achieve ACS certification.*
>
> ***Joint majors in chemistry-climate*** *are required to take Chem 51, 56 and 103 for graduation and would need to additionally take both Chem 104 and 182 to achieve ACS certification.*

2. In addition, students obtaining the certified degree must take the equivalent of four one-semester in-depth courses corresponding to at least 12 semester credit hours. The in-depth experience builds technical expertise, provides a more sophisticated view of chemical concepts, fosters critical thinking, promotes skill development, and gives the student an opportunity for the intellectual growth and rigorous thinking that comes from engaging in topics at a high level. In-depth courses must have one or more foundation courses as prerequisites.

HMC students meet this requirement by taking a combination of approved in-depth courses and senior thesis research. For senior thesis research, chemistry majors take 4-6 credits of Chem151-152 (or approved equivalent capstone with significant chemistry content), while joint chemistry-biology and joint chemistry-climate majors take 6 credits of senior thesis research. Research counts for 3 credits towards ACS certification. The remaining 9 credits necessary to achieve a total of 12 in-depth credits can be achieved by taking courses from this list: 105, 106 (previously 52), 114, 116, 122, 161, 163, 164, 165, 166, 167, 168, 170, 171, 173, 190, 192, 193, 194. For Chem 193 to count, it must have been offered with at least one foundational course as a prerequisite. Substitutions are allowed, but the course must meet the requirements for an in-depth course as described above and be approved by the department chair.

> ***Chemistry majors*** *can fulfill this requirement by completing the major as long as they complete at least 9 credits of chemistry electives that meet the requirements for in-depth chemistry.*
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> ***Joint chemistry-biology majors*** *are required to take Chem 105 and senior thesis research for graduation. In order to achieve ACS certification, joint majors should take at least 6 additional credits of in-depth courses.*
>
> ***Joint chemistry-climate majors*** *fulfill this requirement as they are required to take Chem 170, CLES 101, senior thesis research, and one additional advanced 3 credit chemistry course for graduation.*

3. The certified graduate must have 400 hours of laboratory experience beyond the introductory chemistry laboratory. This laboratory experience must cover at least four of the five traditional chemistry subdisciplines. While the experiments in these courses often consist of well-defined laboratory exercises, open-ended exploratory exercises are encouraged in foundation laboratories.

HMC Chemistry majors *meet this requirement by taking 4 of the following courses as part of their major: Chem 53 (60 lab hours), Chem 58 (60 lab hours), Chem 109 (60 lab hours), Chem 110 (60 lab hours), and Chem 184 (60 lab hours). In addition, chemistry majors complete 4-6 credits of Chem 151-152 [or approved equivalent capstone experience with significant chemistry content] (which counts for 180 lab hours towards certification).*

Joint chemistry-biology majors *meet this requirement as the major requires Chem 58 (60 lab hours), Chem 184 (60 lab hours), and two of: Chem 53 (60 lab hours), Chem 109 (60 lab hours), Chem 110 (60 lab hours), and Chem 111 (60 lab hours). In addition, joint chemistry-biology majors complete 6 credits of Chem 151-152 [or approved equivalent capstone experience with significant chemistry content] (which counts for 180 lab hours towards certification).*

Joint chemistry-climate majors *are required to take Chem 109 (60 lab hours), 6 credits of Chem 151-152 [or approved equivalent capstone experience with significant chemistry content] (which counts for 180 lab hours towards certification), and one of the following: Chem 53 (60 lab hours), Chem 58 (60 lab hours), Chem 110 (60 lab hours), Chem 112 (60 lab hours), Chem 184 (60 lab hours). In order to meet the requirement, majors must take at least 2 additional laboratory courses such that they complete 3 of the laboratories from this list.*