

Molecular, Cellular & Developmental Biology

The Senior Requirement

In addition to the course work described on previous pages, all majors in Yale College must satisfy a senior requirement. In MCDB, this can be accomplished in any of several ways, depending on whether the student is a candidate for a BA, BS, BS INT, or BS/MS degree. *The senior requirement must be done during the senior year.*

The BA Degree [0 (senior essay) or 1 (MCDB 475) credit]

The requirement can be met in either of two ways: by submitting a senior essay of 15-20 pages evaluating current research in a field of biology; or by successful completion of one credit of Senior Independent Research (MCDB 475a or b).

A senior choosing to fulfill the requirement with a senior essay must consult with a faculty advisor on the scope and literature of the topic and submit their written approval to the office of the director of undergraduate studies at least one month before the paper is due in the student's last term. The senior essay may be related to the subject matter of a course, but the essay is a separate departmental requirement in addition to any work done in a course. It does not count toward the grade in any course. The senior essay must be completed and submitted via email to crystal.adamchek@yale.edu at the office of the director of undergraduate studies by the last day of classes. Students electing this option should obtain an approval form from the office of the director of undergraduate studies.

The BS Degree [2 (MCDB 485 & 486) or 2 (MCDB 475 & 475) credits]

The BS differs from the BA in its greater emphasis on individual research. The senior requirement for the standard BS is two contiguous terms of Senior Research: MCDB 485a/486b. However, students may take 2 contiguous terms of MCDB 475, at least one of which must be taken during the senior year. Ordinarily both terms of Research will be taken during the senior year, but it is possible for a student to begin work toward the senior requirement in the spring of the junior year by taking MCDB 475b, continue the research over the summer, and complete it during the fall of the senior year by taking MCDB 475a – which must be pre-approved by the DUS. Yale College does not grant academic credit for summer research unless the student is enrolled in an independent research course in Yale Summer Session.

The BS INT Degree [4 (MCDB 495 & 496) credits]

For the MCDB BS Intensive major, students fulfill the senior requirement by taking MCDB 495a/496b, Senior Research Intensive, for four credits during their senior year.

The Combined BS/MS Degree Program

Because of the additional and substantial requirements associated with thesis work in the third and fourth years, there is no Senior Requirement *per se*.

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The Senior Requirement – Some Special Options During Covid-19 Pandemic

We hope that seniors will be able to complete their senior research as originally outlined above. For instance, it may be possible to work in lab during the fall of 2020, or some research projects involving data analysis or computation may be pursued remotely. However, should it not be possible to complete the research requirements, we are making the following substitutions possible to count towards senior requirements.

In addition, if it becomes necessary to move away from in-person research during fall 2020 or spring 2021 semesters, those enrolled in senior research courses will be transitioned to MCDB 470/471-style tutorials or other arrangements made with their lab with permission of the DUS, while remaining enrolled in the original course number.

The BA Degree [0 (senior essay) or 1 (MCDB 475) credit or 1 (MCDB 350+) credit or 1 (MCDB 470) credit or 1 (MCDB 471) credit]

- A) A course MCDB 350 or higher may be substituted for MCDB 475. This is in addition to the regular requirement for an MCDB 350+.
- B) MCDB 470 or MCDB 471 may be substituted for MCDB 475.
- C) The senior essay option remains an option instead of either of these.

The BS Degree [2 (MCDB 485 & 486) or 2 (MCDB 475 & 475)) or 2 (MCDB 350+/MCDB 470) credits]

- A) During the pandemic, the two independent research courses MCDB 485/486 or MCDB 475 can be replaced by MCDB courses numbered at or above 350. These are in addition to the regular major requirement of one MCDB 350+ course.
- B) The research courses may also be replaced by the new MCDB 470 or MCDB 471 courses. These can replace one or both terms.

The BS INT Degree [4 (MCDB 495 & 496) credits or 4 credits from MCDB350+/470/471]

Given the research-intensive nature of this degree, the best option is to fulfill the Senior Requirement with 4 credits of independent research. We will, however, allow the substitution of any combination of 4 MCDB courses numbered at or above 350 or the new MCDB 470 or 471 courses. *Any of the options other than the 4 credits of independent research will require the permission of the DUS.*

The MCDB 350+ courses in this option are in addition to the regular major requirement of one MCDB 350+ course.

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MCDB 470 – Tutorial in MCDB

Offered fall 2020 and likely spring 2021. Individual or small-group study for qualified students who wish to investigate an area of experimental biology not presently covered by regular courses. A student must secure the sponsorship of a Yale faculty member, who sets the specific requirements. The course will include one or more written works and is expected to meet at least once per week. *It will require the submission of a brief course description, a syllabus and a reading list to and permission from the DUS at the beginning of the term.*

This course may be taken only by seniors and can be used only to satisfy the Senior Requirement in MCDB.

MCDB 471 – Senior Seminar in Biology

Offered fall 2020 and spring 2021. Small Group study where students meet weekly with instructor to discuss a range of specific topics in the biological sciences and to develop effective writing and speaking skills required for preparation of scientific manuscripts, presentations and general communication in the scientific world. Students will be required to prepare and present oral presentations and to submit a literature review and written grant proposal by the end of the semester.

This course may be taken only by seniors and can be used only to satisfy the Senior Requirement in MCDB.