

Biochemical Sciences

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**THE REQUIREMENTS BELOW ARE FOR BIOCHEMICAL SCIENCES
CONCENTRATORS WHO ENTERED THE COLLEGE BEFORE SEPTEMBER 2006.
THE BIOCHEMICAL SCIENCES CONCENTRATION IS NOT OPEN TO
STUDENTS WHO ENTERED THE COLLEGE IN SEPTEMBER 2006 OR LATER.**

REQUIREMENTS

Basic Requirements: 12 half-courses

1. *Required courses:*
 - a. *Life Sciences:* Life Sciences 1a and Life Sciences 1b are ordinarily required for students entering the college in September 2005 or later. Students who entered before September 2005 are not required to complete Life Sciences 1a and Life Sciences 1b.
 - b. *Biology:* Biological Sciences 52 and 54 (now MCB 52 and 54). Students who have not taken Life Sciences 1b must also include a course in genetics—ordinarily Biological Sciences 50 or a more advanced course (see items 5c and 5d).
 - c. *Chemistry:* Three half-courses for students who have taken Life Sciences 1a or four half-courses for those who have not (see item 5e).
 - d. *Mathematics:* Two half-courses (see item 5f).
 - e. *Physics:* Two half-courses (see item 5g).
 - f. Any other half-course above the introductory level in biology, chemistry, mathematics, or physics (see item 5b).
2. *Tutorial:* Required of all concentrators in their sophomore, junior and senior years; non-credit.
3. *Thesis:* None.
4. *General Examination:* None.
5. *Other information:*
 - a. *Pass/Fail:* Courses counted for concentration may not be taken Pass/Fail.
 - b. Only four half-courses counted for concentration may be introductory. Courses currently regarded as introductory are: Chemistry 5; Mathematics 1a, 1b; Physics 1a, 1b; Life Sciences 1a, 1b.
 - c. Students who entered the College before September 2005 must include in their programs a course in genetics - ordinarily Biological Sciences 50 or Life Sciences 1b, or a more advanced course where appropriate.
 - d. Since basic courses in mathematics, chemistry, and physics are prerequisite to all further study, it is important that these courses be taken early. In particular, it is essential that concentrators complete a course in organic chemistry no later than the end of the sophomore year.
 - e. Students who entered the College before September 2005 and started with Chemistry 17 and 27 or Chemistry 20 and 30 (rather than with Chemistry 7) receive the credit equivalent of Chemistry 5 and 7. Students who entered the College after 2005 and started with Chemistry 17 and 27 or Chemistry 20 and 30 (rather than with Chemistry 7 or Physical Sciences 1) receive the credit equivalent of Chemistry 7.
 - f. Mathematics at the level of 21a is a prerequisite for the Physics 11 and 15 sequences.

- g. Honors candidates must elect the Physical Sciences 2 and 3 sequence, the Physics 11 sequence (11a or 11c and 11b) or Physics 15a (or 16) and 15b. This requirement is based on the conviction that it is important in all areas of science to have experience in making formal models of physical systems and in working out the relationship between mathematical derivations and physical reality. Physics 1 satisfies item 1e of the **Basic Requirements** but not the **Requirements for Honors Eligibility**.
- h. Courses offered by the School of Engineering and Applied Sciences and by the Division of Medical Sciences may be counted for concentration credit wherever appropriate.
- i. Courses given under the Core Curriculum may not be counted for concentration credit, except by special approval.

Requirements for Honors Eligibility: 15 half-courses

1. *Required courses:*
 - a.-f Same as **Basic Requirements**.
 - g. One additional half-course above the introductory level in biology, chemistry, mathematics, or physics. A course in physical chemistry and macromolecular biology is required for honors candidates who entered the College before September 2005.
 - h. To be eligible for honors in the field, a student may take either 13 half-courses and write a thesis (see item 1i, below), or complete the Advanced Course Option by taking two additional courses at an advanced level with a laboratory course (see item 1j, below).
 - i. *Thesis option:* Students generally enroll in Biochemical Sciences 91r during their junior year, and complete Biochemical Sciences 99 during the fall and spring of their senior year.
-or-
 - j. *Advanced Course Option:* counts as the equivalent of the senior thesis option. Two additional half-courses (MCB courses numbered 100 or above) or as approved by the Head Tutor, plus a laboratory course such as Biochemical Sciences 91r; MCB 100; MCB 116 or 117; Chemistry 135 or 165; LS 100r; or Physics 123 or 191r. The laboratory course can be used to fulfill the requirement in 1g.
2. *Tutorial:* Required of all concentrators in the sophomore, junior, and senior years; non-credit.
3. *Thesis:* See items 1h and 1i.
4. *General Examination:* None.
5. *Other information:*
 - a. Advanced Placement credits may be counted (with or without Advanced Standing), provided the total number of courses taken at Harvard does not fall below twelve half-courses, and provided the student does not enroll in a course for which the advanced placement credit was granted.
 - b. Advanced Placement credit for Mathematics 1a and 1b may ordinarily be counted only if the student begins with Mathematics at the level of 19 or 21 (or a more advanced course) at the College. Advanced Placement credit for Chemistry 7 may ordinarily be counted if the student begins with Chemistry 17 or Chemistry 20.

ADVISING

The Board of Tutors advises undergraduates and provides academic resources as well as individualized instruction (tutorials) to all students in the concentration. Tutors hold an MD and/or PhD degree and are engaged in laboratory research in Cambridge, at Harvard Medical School, or at a related institution. Advising for courses, laboratory research, summer plans, and career choices takes place as a logical extension of the tutorial.

Students entering the concentration as juniors or seniors are advised by a member of the Board of Tutors before being assigned to a tutor. The Head Tutor makes all tutorial assignments and is available throughout the academic year to answer questions from students or their tutors.

The concentration adviser, Dr. Thomas Torello, is available to concentrators to provide guidance on course selection, laboratory research, and the fulfillment of concentration requirements. Contact Dr. Torell (torello@fas.harvard.edu or 617-495-4106) for more information. For up-to-date information on advising in Biochemical Sciences, please see the Advising Programs Office website: www.fas.harvard.edu/~advising/concentrations/Biochemical.html.

RESOURCES

A Tutorial Reference Library is housed in the Student Affairs Office at 7 Divinity Avenue, and contains books and journals frequently used for tutorial reading.

HOW TO FIND OUT MORE

Co-Head Tutor: Professor Richard M. Losick, 7 Divinity Avenue, 617-495-4106. Co-Head Tutor: Professor Rachelle Gaudet, 7 Divinity Avenue, 617-495-5616. Concentration Adviser: Dr. Thomas Torello, 7 Divinity Avenue, torello@fas.harvard.edu or 617-495-4106.

Lists of members of the Board of Tutors in Biochemical Sciences and of the Department of Molecular and Cellular Biology and descriptions of their research interests are available in the Tutorial Office, 7 Divinity Avenue. See also www.mcb.harvard.edu.

ENROLLMENT STATISTICS

Number of Concentrators as of November

Concentrators	2002	2003	2004	2005	2006
Biochemical Sciences	241	234	225	245	209
Biochemical Sciences + another field	0	1	1	4	2
Another field + Biochemical Sciences	1	1	0	0	0