

OFFICE OF THE PRESIDENT

May 17, 2012

Interim Dean Robert C. Stacey College of Arts and Sciences Box 353765

Dear Bob:

Based on the recommendation of the Subcommittee on Admissions and Programs, the Faculty Council on Academic Standards has recommended approval of the revised admission requirements for both the Bachelor of Arts degree and the Bachelor of Science degree in Biochemistry as well as the revised program requirements for the Bachelor of Science degree in Biochemistry. A copy of the changes is attached.

I am writing to inform you that the Department of Chemistry is authorized to specify these requirements beginning spring quarter 2012.

The new requirements should be incorporated in printed statements and in individual department websites as soon as possible. The *General Catalog* website will be updated accordingly by the Registrar's Office.

Sincerely yours,

Michael K. Young President

Enclosure

cc: Ms. Mary Harty (with enclosure)

Mr. Robert Corbett (with enclosure)

Dr. Deborah H. Wiegand (with enclosure)

Ms. Virjean Edwards (with enclosure BIOC-20120209)



# UNIVERSITY OF WASHINGTON CREATING AND CHANGING UNDERGRADUATE ACADEMIC PROGRAMS

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After college/school/campus review, send a signed original and 1 copy to the Curriculum Office/FCAS, Box 355850. For information about when and how to use this form: http://depts.washington.edu/uwcr/1503instructions.pdf

College/Campus Arts & Science / Seattle	Department/Unit Biochemistry	Date 2/9/2012	
New Programs	Dopartmont of the Biochemistry	Date 2/9/2012	
Leading to a Bachelor of in degree.			
Leading to a Bachelor ofdegree with a major in			
Leading to a Option within the existing major in			
Leading to a minor in			
Changes to Existing Programs  New Admission Requirements for the Major in	within the Bachelor of		
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Revised Admission Requirements for the Major in <u>Biochemistry</u> within the Bachelor of <u>Science and Bachelor of Arts</u> .  Revised Program Requirements for the Major in <u>Biochemistry</u> within the Bachelor of <u>Science</u> .			
Revised Requirements for the Option inwithin the major in			
Revised Requirements for the Minor in			
Other Changes			
Change name of program from to  New or Revised Continuation Policy for to Eliminate program in			
Proposed Effective Date: Quarter: Autumn Winter Spring Summer Year: 2012			
	6-9880 Email: harty@chem.washington.edu	Box: 351700	
EXPLANATION OF AND RATIONALE FOR PROPOSED	CHANGE		
	For new program, please include any relevant supporting documentation such as student learning outcomes, projected enrollments, letters of support and departmental handouts. (Use additional pages if necessary).		
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# **Current catalog copy: Biochemistry**

# **Undergraduate Program**

Adviser 109 Bagley, Box 351700 206-616-9880, 206-543-9343, 206-685-8376 advisers@chem.washington.edu

The Biochemistry Program offers the following programs of study:

- The Bachelor of Science degree with a major in biochemistry (requires 197 credits)
- The Bachelor of Arts degree with a major in biochemistry

### **Bachelor of Science**

Suggested First- and Second-Year Courses: BIOL 180, BIOL 200 (or BIOL 201, BIOL 202); CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165), CHEM 237, CHEM 238, CHEM 239, CHEM 241, CHEM 242; MATH 124, MATH 125, MATH 126; PHYS 121, PHYS 122, PHYS 123 (or PHYS 114, PHYS 115, PHYS 116 with one physics lab course strongly recommended).

# **Program Admission Requirements**

Beginning spring quarter 2010, application to B.A. and B.S. degree programs in biochemistry is competitive. Applicants are considered in the following groups: Direct Freshman Admission, Early Admission, First-Year Admission, and Regular Admission. Completion of minimum requirements described below does not guarantee admission. All applicants have the right to petition and appeal the department's admission decision. Applications are considered twice each academic year and are due on the second Friday of October and the second Friday of April, with the exception of Direct Freshman Admission. The application and additional information is available at depts.washington.edu/chem/undergrad/.

#### **Direct Freshman Admission**

- 1. Open to freshman students formally admitted to the UW.
- 2. Score of 5 on the AP chemistry examination.
- 3. Indication on the UW freshman application of biochemistry as the student's first choice of major.
- 4. Successful direct-admission applicants generally have received a minimum 1400 on the SAT (math and verbal sections), or minimum 30 on the ACT.
- 5. Admission is for autumn quarter only.

#### Early Admission

- 1. Students with exceptional records can apply for consideration for early admission to the biochemistry major via the Honors or Research track. Students seeking early admission should submit an application that includes:
  - a. Cover sheet (available on the Department of Chemistry Website)
  - b. Unofficial transcript
  - c. Statement of purpose. May include a description of interest in biochemistry, career goals, undergraduate research interests, degree interest (B.A. or B.S.), and any other information applicant believes is useful in evaluating the application.
  - d. (Research Track only) Written letter or recommendation from research adviser.
- 2. Honors Track. Students participating in the chemistry Honors sequence who have completed the following courses with a minimum cumulative GPA of 3.00: CHEM 145, CHEM 155 (10 credits); MATH 124 and MATH 125, or MATH 134 and MATH 135 (10 credits).
- 3. Research Track. Students who have performed at least 6 credits of undergraduate research (CHEM 199, CHEM 299 or higher) and who provide a strong recommendation from faculty research adviser. Chemistry undergraduate research may be considered as well.

#### First Year Admission

- Course requirements: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165) (15 credits). BIOL 180 (5 credits); MATH 124, MATH 125 (or MATH 134, MATH 135) (10 credits).
- 2. Factors included in the admission decision include academic performance as measured by GPA in courses required for application, difficulty of other courses completed, frequency of incompletes or withdrawal grades, number of repeated courses, relevant work and life experience, and record of honors.
- 3. Successful applicants for the B.S. biochemistry program typically have a cumulative GPA greater than 3.20 in courses listed above under course requirements. Successful applicants for the B.A. biochemistry program typically have a cumulative GPA greater than 3.00 in courses listed above under course requirements.

### **Regular Admission**

- Course requirements: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM145, CHEM 155, CHEM 165) (15 credits). CHEM 237, CHEM 238 (or CHEM 335, CHEM 336) (8 credits). BIOL 180, BIOL 200 (10 credits). MATH 124, MATH 125 (or MATH 134, MATH 135) (10 credits).
- 2. Factors in the admission decision include academic performance as measured by GPA in courses required for application, difficulty of other courses completed, frequency of incompletes or withdrawal grades, number of repeated courses, relevant work and life experience, and record of honors.

3. Successful applicants for the B.S. biochemistry program typically have a cumulative GPA greater than 2.50 in courses listed above under course requirements, with no individual course grade lower than a 2.0. Successful applicants for the B.A. biochemistry program typically have a cumulative GPA greater than 2.00 in courses listed above under course requirements, with no individual grade below a 1.7.

### **Continuation Policy**

Students enrolled in the degree programs in biochemistry must maintain both a cumulative GPA and individual course grades consistent with requirements for their degree. Students pursuing B.S. degrees must maintain a minimum cumulative GPA of 2.50 for courses required for the major, and minimum 2.0 grades for individual courses required for the major. Students pursuing B.A. degrees must maintain a minimum cumulative GPA of 2.00 for courses required for the major, and a minimum 1.7 for individual courses required for the major. Failure to maintain these GPA and grade standards results in the student being placed on academic probation for one quarter, and dropped from the major if marked improvement in academic performance is not achieved. Students who experience extraordinary circumstances may petition for one or more additional probationary quarters.

## **Major Requirements**

## 107 credits, as follows:

- 1. General Chemistry: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165)
- Organic Chemistry: CHEM 237, CHEM 238, CHEM 239, CHEM 241, CHEM 242 (or CHEM 335, CHEM 336, CHEM 337, CHEM 346, CHEM 347)
- 3. Physical Chemistry: CHEM 452, CHEM 453 (or CHEM 455, CHEM 456, CHEM 457)
- 4. Biochemistry: BIOC 426, BIOC 440, BIOC 441, BIOC 442
- 5. Biology: BIOL 180, BIOL 200
- 6. Mathematics: MATH 124, MATH 125, MATH 126 (or MATH 134, MATH 135, MATH 136)
- 7. Physics: PHYS 121, PHYS 122, PHY 123 (or PHYS 114, PHYS 115, PHYS 116), with the PHYS 121 sequence recommended
- 8. Genome Science: GENOME 371
- 9. 11 credits chosen from a current department list (available in 303 Bagley or at depts.washington.edu/chem/undergrad/degreereqs.html) of upper-division science classes including math, biology, microbiology, chemistry, and genome sciences. Up to 9 credits of approved advanced-level undergraduate research may also be applied to this requirement. Research conducted outside chemistry or biochemistry must first be approved by a biochemistry adviser.
- 10. Grade and Graduation Requirements: A minimum grade of 2.0 and a minimum cumulative 2.50 GPA required for all chemistry, biology, and biochemistry courses

counted toward the major. Minimum 2.50 GPA required for the BIOC 440, BIOC 441, and BIOC 442 sequence. Minimum overall cumulative 2.50 GPA required for graduation.

# **Bachelor of Arts**

### 90-92 credits as follows:

- 1. General Chemistry: either CHEM 142, CHEM 152, CHEM 162, (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165)
- 2. Organic Chemistry: either CHEM 237, CHEM 238, CHEM 239, CHEM 241, CHEM 242, or CHEM 335, CHEM 336, CHEM 337, CHEM 346, CHEM 347
- 3. Biochemistry: BIOC 405, BIOC 406
- 4. Physical Chemistry: CHEM 452, CHEM 453
- 5. Biology: BIOL 180, BIOL 200
- 6. Mathematics: either MATH 124, MATH 125, MATH 126, or MATH 134, MATH 135, MATH 136
- 7. Physics (12-15 credits): either PHYS 121, PHYS 122, PHYS 123, or PHYS 114, PHYS 115, PHYS 116
- 8. Science Electives: 9 credits to be taken from a current department list available in 303 Bagley or at depts.washington.edu/chem/undergrad/degreereqs.html. Up to 3 credits of advanced undergraduate research may count toward this requirement. Research conducted outside chemistry or biochemistry must first be approved by a biochemistry adviser.
- 9. Grade and Graduation Requirements: Minimum grade of 1.7 in chemistry, biochemistry, and biology courses required for the major. Minimum cumulative 2.00 GPA required for graduation.

# **Student Outcomes and Opportunities**

• Learning Objectives and Expected Outcomes: At the conclusion of their studies, graduating biochemistry majors should possess a general working knowledge of the basic areas of biochemistry; be proficient in basic laboratory skills; have the ability to carry out strategies for solving scientific problems; have an understanding of the principles and applications of modern instrumentation, computation, experimental design, and data analysis; have had the opportunity to gain experience with a research project; have the ability to communicate scientific information clearly and precisely; have the ability to read, understand, and use scientific literature; have an awareness of the broader implications of biochemical processes; have had the opportunity to work as part of a team to solve scientific problems; and have had an introduction to opportunities in, and requirements for, the careers available to biochemistry majors.

Students planning a career in biomedical research, the health are for its expectations.

Students planning a career in biomedical research, the health professions, or biotechnology find the biochemistry degree to be an excellent choice. The degree is also

- good preparation for graduate school in any aspect of biochemical or biomedical research.
- Instructional and Research Facilities: Research facilities for the department are housed in the Biochemistry-Genetics Building, which provides approximately 52,000 square feet of research space, conference rooms, and a departmental library. In the immediate vicinity are the departments of Immunology, Genome Sciences, Microbiology, and Pharmacology, as well as programs in biomolecular structure, molecular medicine, neurobiology and molecular and cellular biology, with which the department has common research interests. Laboratories are equipped with modern research equipment and are supported by external, centralized research facilities. An emphasis on biomedical research is facilitated by the location of the department within the School of Medicine.
- Honors Options Available: College Honors (Completion of both Interdisciplinary Honors and Departmental Honors requirements). Departmental Honors (see adviser for requirements).
- Research, Internships, and Service Learning: No formal internship program. Students are encouraged to pursue national and regional internships. See adviser for more information.
- Program Scholarships: Resident tuition scholarships and book prizes are awarded annually by the Department of Chemistry to eligible chemistry and biochemistry majors. Applications are available during the month of March for the following academic year. See department adviser for more information.
- Student Organizations/Associations:
  - Alpha Chi Sigma: the UW affiliate of the national chemistry-related science organization for chemistry and biochemistry majors
  - Phi Lambda Upsilon: the UW affiliate of the national chemistry honorary society
  - The Free Radicals: a general undergraduate club for chemistry and biochemistry majors.

# Of Special Note:

The Bachelor of Science in Biochemistry degree requires a minimum of 197 credits.

Students are strongly encouraged to participate in undergraduate research.

# **Proposed Catalog Copy: Biochemistry**

# **Undergraduate Program**

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### **Bachelor of Science**

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- 5. Admission is for autumn quarter only.

#### Research/Honors Admission

- 1. Students with exceptional records can apply for consideration for early admission to the biochemistry major via the Honors or Research track. Students seeking early admission should submit an application that includes:
  - a. Cover sheet (available on the Department of Chemistry Website)
  - b. Unofficial transcript
  - c. Statement of purpose. May include a description of interest in biochemistry, career goals, undergraduate research interests, degree interest (B.A. or B.S.), and any other information applicant believes is useful in evaluating the application.
  - d. (Research Track only) Written letter or recommendation from research adviser.
- Honors Track. Students participating in the chemistry Honors sequence who have completed the following courses with a minimum cumulative GPA of 3.00: CHEM 145, CHEM 155 (10 credits); MATH 124 and MATH 125, or MATH 134 and MATH 135 (10 credits).
- 3. Research Track. Students who have performed at least 6 credits of undergraduate research (CHEM 199, CHEM 299 or higher) and who provide a strong recommendation from faculty research adviser. Chemistry undergraduate research may be considered as well.

### Early Admission

- Course requirements: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165) (15 credits). BIOL 180 (5 credits); MATH 124, MATH 125 (or MATH 134, MATH 135) (10 credits).
- 2. Factors included in the admission decision include academic performance as measured by GPA in courses required for application, difficulty of other courses completed, frequency of incompletes or withdrawal grades, number of repeated courses, relevant work and life experience, and record of honors.
- 3. Successful applicants for the B.S. biochemistry program typically have a cumulative GPA greater than 3.20 in courses listed above under course requirements. Successful applicants for the B.A. biochemistry program typically have a cumulative GPA greater than 3.00 in courses listed above under course requirements.

### **Regular Admission**

- Course requirements: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM145, CHEM 155, CHEM 165) (15 credits). CHEM 237, CHEM 238 (or CHEM 335, CHEM 336) (8 credits). BIOL 180, BIOL 200 (10 credits). MATH 124, MATH 125 (or MATH 134, MATH 135) (10 credits).
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# **Major Requirements**

## 105 credits, as follows:

- 1. General Chemistry: CHEM 142, CHEM 152, CHEM 162 (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165)
- Organic Chemistry: CHEM 237, CHEM 238, CHEM 239, CHEM 241, CHEM 242 (or CHEM 335, CHEM 336, CHEM 337, CHEM 346, CHEM 347)
- 3. Physical Chemistry: CHEM 452, CHEM 453 (or CHEM 455, CHEM 456, CHEM 457)
- 4. Biochemistry: BIOC 426, BIOC 440, BIOC 441, BIOC 442
- 5. Biology: BIOL 180, BIOL 200
- 6. Mathematics: MATH 124, MATH 125, MATH 126 (or MATH 134, MATH 135, MATH 136)
- 7. Physics: PHYS 121, PHYS 122, PHY 123 (or PHYS 114, PHYS 115, PHYS 116), with the PHYS 121 sequence recommended
- 8. Genome Science: GENOME 361 or GENOME 371
- 9. 11 credits chosen from a current department list (available in 303 Bagley or at depts.washington.edu/chem/undergrad/degreereqs.html) of upper-division science classes including math, biology, microbiology, chemistry, and genome sciences. Up to 9 credits of approved advanced-level undergraduate research may also be applied to this requirement. Research conducted outside chemistry or biochemistry must first be approved by a biochemistry adviser.
- 10. Grade and Graduation Requirements: A minimum grade of 2.0 and a minimum cumulative 2.50 GPA required for all chemistry, biology, and biochemistry courses

counted toward the major. Minimum 2.50 GPA required for the BIOC 440, BIOC 441, and BIOC 442 sequence. Minimum overall cumulative 2.50 GPA required for graduation.

### **Bachelor of Arts**

### 90-92 credits as follows:

- 1. General Chemistry: either CHEM 142, CHEM 152, CHEM 162, (or CHEM 144, CHEM 154, CHEM 164; or CHEM 145, CHEM 155, CHEM 165)
- 2. Organic Chemistry: either CHEM 237, CHEM 238, CHEM 239, CHEM 241, CHEM 242, or CHEM 335, CHEM 336, CHEM 337, CHEM 346, CHEM 347
- 3. Biochemistry: BIOC 405, BIOC 406
- 4. Physical Chemistry: CHEM 452, CHEM 453
- 5. Biology: BIOL 180, BIOL 200
- 6. Mathematics: either MATH 124, MATH 125, MATH 126, or MATH 134, MATH 135, MATH 136
- 7. Physics (12-15 credits): either PHYS 121, PHYS 122, PHYS 123, or PHYS 114, PHYS 115, PHYS 116
- 8. Science Electives: 9 credits to be taken from a current department list available in 303 Bagley or at depts.washington.edu/chem/undergrad/degreereqs.html. Up to 3 credits of advanced undergraduate research may count toward this requirement. Research conducted outside chemistry or biochemistry must first be approved by a biochemistry adviser.
- 9. Grade and Graduation Requirements: Minimum grade of 1.7 in chemistry, biochemistry, and biology courses required for the major. Minimum cumulative 2.00 GPA required for graduation.

# **Student Outcomes and Opportunities**

• Learning Objectives and Expected Outcomes: At the conclusion of their studies, graduating biochemistry majors should possess a general working knowledge of the basic areas of biochemistry; be proficient in basic laboratory skills; have the ability to carry out strategies for solving scientific problems; have an understanding of the principles and applications of modern instrumentation, computation, experimental design, and data analysis; have had the opportunity to gain experience with a research project; have the ability to communicate scientific information clearly and precisely; have the ability to read, understand, and use scientific literature; have an awareness of the broader implications of biochemical processes; have had the opportunity to work as part of a team to solve scientific problems; and have had an introduction to opportunities in, and requirements for, the careers available to biochemistry majors.

Students planning a career in biomedical research, the health professions or

Students planning a career in biomedical research, the health professions, or biotechnology find the biochemistry degree to be an excellent choice. The degree is also

good preparation for graduate school in any aspect of biochemical or biomedical research.

- Instructional and Research Facilities: Research facilities for the department are housed in the Biochemistry-Genetics Building, which provides approximately 52,000 square feet of research space, conference rooms, and a departmental library. In the immediate vicinity are the departments of Immunology, Genome Sciences, Microbiology, and Pharmacology, as well as programs in biomolecular structure, molecular medicine, neurobiology and molecular and cellular biology, with which the department has common research interests. Laboratories are equipped with modern research equipment and are supported by external, centralized research facilities. An emphasis on biomedical research is facilitated by the location of the department within the School of Medicine.
- Honors Options Available: College Honors (Completion of both Interdisciplinary Honors and Departmental Honors requirements). Departmental Honors (see adviser for requirements).
- Research, Internships, and Service Learning: No formal internship program. Students are encouraged to pursue national and regional internships. See adviser for more information.
- Program Scholarships: Resident tuition scholarships and book prizes are awarded annually by the Department of Chemistry to eligible chemistry and biochemistry majors. Applications are available during the month of March for the following academic year. See department adviser for more information.
- Student Organizations/Associations:
  - Alpha Chi Sigma: the UW affiliate of the national chemistry-related science organization for chemistry and biochemistry majors
  - Phi Lambda Upsilon: the UW affiliate of the national chemistry honorary society
  - The Free Radicals: a general undergraduate club for chemistry and biochemistry majors.

# Of Special Note:

The Bachelor of Science in Biochemistry degree requires a minimum of 195 credits.

Students are strongly encouraged to participate in undergraduate research.