

Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Revision of the BSLAS in Integrative Biology- Integrative Biology Honors (IBH) Concentration, College of LAS

SPONSOR: Carol Augspurger, Assoc. Director for Academic Affairs,
School of Integrative Biology, 333-1298, carolaug@illinois.edu

COLLEGE CONTACT: Karen Carney, Associate Dean, LAS, 333-1350,
kmcarney@illionis.edu

BRIEF DESCRIPTION:

MATH

220 Calculus: Recommend Biocalculus section

231 Calculus II: Add option of completing IB 494 Theoretical Biology + Models

241 Calculus III: Drop requirement

CHEMISTRY

BIOC 455 Technqs Biochem & Biotech: Drop requirement

Add 'at least 6 hr of advanced courses in Chemistry'

JUSTIFICATION:

MATH

We propose the following:

1. We recommend the new Biocalculus section in MATH 220 as the first course in the required MATH series; the alternate MATH 221 is retained as an alternative. This new Biocalculus section was developed by mathematicians in MATH and a theoretical biologist in SIB to apply classical calculus in a biological context that is more relevant for our biology students. It also continues to serve as preparation for taking MATH 231, the second calculus course in the series;
2. Add the new IB 494 (Theoretical Biology and Models) as an alternative option for the second course in the MATH series. The same rationale applies, viz. better biological relevance than the physical science-based classical calculus;
3. Remove MATH 241 (Calculus III) as required of all IBH students. Calc III is a pre-requisite for PHYS 212, which is one of the two existing options for the second course in the PHYS series (the other being PHYS 102). Only those students who elect to take PHYS 212 will separately fulfill the Calc III pre-requisite. Students electing to take PHYS 102 will follow the current requirement of completing an upper level course with computational/ modeling/ math emphases.

CHEMISTRY

1. We were compelled to revise our CHEM requirements following the recent change by Chemistry in its requirements for the CHEM MINOR (effective FA2015 for newly admitted students). Currently, all IBH students earn a CHEM MINOR upon completing the combination of CHEM/MCB/BIOC courses in the existing IBH POS. The change by Chemistry requires enrolling in approved courses under the CHEM rubric only, removing

MCB 450 (Introductory Biochemistry) and BIOC 455 (Technqs Biochem & Biotech) as qualified advanced courses. Six hours of Chemistry-approved, advanced CHEM courses are required to earn the CHEM MINOR. To maintain the CHEM MINOR in the IBH POS, students will select from five recommended and Chemistry approved advanced courses to fulfill the required six hours.

2. We will retain MCB 450 as a specific requirement because of its fundamental importance to our biology students, and will drop BIOC 455, an intensive and time-consuming lab course not uniformly relevant for the diverse interests of the IBH students.
3. We currently tie CHEM 232/233 to the CHEM 100-series, and CHEM 236/237 to the CHEM 200-series. This is more restrictive than the official Chemistry Minor requirement, which offers a choice between CHEM 232/233 and CHEM 236/237, whether student takes the 100- or 200- Intro series. We plan to follow the same combinations possible for the Chemistry Minor requirement.

BUDGETARY AND STAFF IMPLICATIONS:

1) Resources

No additional financial resources are required for the proposed revisions.

2) Resource Implications

a) Faculty Resource

No impacts on faculty resources are expected; see enrollment implications below.

b) Course Enrollments

MATH:

Recommending students to take MATH 220 (Biocalculus section) will have a positive impact as it is a new course offering and we are trying to build up its enrollment. Providing a choice between MATH 231 and IB 494, and dropping MATH 241 as specific requirement for all IBH student (only those electing to take PHYS 212 will need to take MATH 241 as prerequisite, will lead to fewer IBH students enrolling in these two MATH courses. However, the impact on these two widely subscribed courses will be minimal because the IBH student body is small, about 25 per year.

CHEMISTRY:

Students will take two additional courses in CHEM (at least 6 hrs). We dropped one BIOC course (4 hrs). Each year about 25 new students enroll in IB Honors. Enrollment by these students will be spread among five recommended courses over two semesters. We have communicated directly with Chemistry; their support of this proposal is attached as Appendix B.

c) No anticipated impact on University Library

d) Technology and space

Minor impacts on technology and space are expected. The change in student enrollment in any one course is expected to be minimal. CHEM 437 (one of the choices for advanced CHEM hours) has a limited lab space, but we don't expect many students to take that time-consuming course; they have options of other courses if that course is restricted in any given semester.

DESIRED EFFECTIVE DATE: Fall 2016

STATEMENT FOR ACADEMIC CATALOG:**Overview tab- NO CHANGES**

Carla Caceres

286 Morrill Hall, 505 South Goodwin Avenue, Urbana

PH: (217) 333-3044

<http://sib.illinois.edu/>

Students in **Integrative Biology** focus on the disciplines of genetics, physiology, behavior, ecology and evolution. In Integrative Biology, the emphasis is on bringing multiple disciplines to bear on complex scientific questions. From genomics to global change, Integrative Biology seeks to discover the complex interrelationships between organisms and the physical and biological environment in which they live. This major prepares students for careers in medicine and the health professions, research, organisms, and the environment. The School of Integrative Biology also sponsors two minors. The Minor in Integrative Biology is designed for students intending to have a career for which a background in integrative biology is complementary, e.g. law, technology, bioinformatics, business, scientific writing, and engineering. The Minor in Ecology and Conservation Biology prepares students for diverse careers, including environmental lawyer, environmental consultant, conservation technician, environmental educator, and environmental engineer.

Major tab: NO CHANGES

For the Degree of Bachelor of Science in Liberal Arts and Sciences

Major in Sciences and Letters Curriculum

Students must select one concentration.

- [Integrative Biology Concentration](#)
- [Integrative Biology Honors Concentration](#)

Integrative Biology Honors concentration webpage: REVISIONS

Integrative Biology Honors Concentration

For the Degree of Bachelor of Science in Liberal Arts and Sciences

Major in Sciences and Letters Curriculum

Integrative Biology Honors is designed for superior students wishing to pursue an intensive program in integrative biology and, concurrently, to gain a strong background in the physical sciences and mathematics. Admission is by interview in spring of the freshman year prior to registration for fall. An overall 3.0 GPA is required to apply for

admission. Integrative Biology Honors provides preparation suitable for graduate and professional training in biology, as well as for biology careers in the private and public sectors.

E-mail: honors@sib.illinois.edu

Minimum required courses normally equate to 80-91 hours.

Students earning the Integrative Biology Honors Concentration will **also earn** the CHEM minor.

Students pursuing a degree in Integrative Biology Honors will be allowed to earn a second degree in the Specialized Curriculum in Biochemistry. Students pursuing a degree in Integrative Biology Honors will not be allowed to double major in Molecular and Cellular Biology.

General education: Students must complete the [Campus General Education requirements](#) including the campus general education language requirement.

Twelve hours of 300- and 400-level courses in the major must be taken on this campus.

No more than 8 hours of credit in 100-level courses in IB or MCB may be counted toward graduation.

Students may count toward graduation no more than a combined maximum of 10 hours of **IB 390** and **IB 490** credit offered for independent study.

Substitutions or other changes in the requirements below may be made only by petition to and approval of the director of the Integrative Biology Honors Concentration.

Minimum hours required for graduation: 120 hours

Departmental distinction: Candidates for distinction must:

1. Consult with an IB Honors adviser no later than the beginning of their junior year to discuss their proposed research plan.
2. Have a minimum GPA of 3.25 when applying for distinction.
3. Present an acceptable written report on the research to the Integrative Biology Distinction Committee about two months prior to graduation. The research must have been an in-depth experience and produced substantial results to be considered eligible for distinction. Additional details on requirements, procedures, and deadlines are available at sib.illinois.edu/undergraduate/distinction.

Students must consult with their Integrative Biology honors adviser at least once each semester.

IB 150	Organismal & Evolutionary Biol	4
MCB 150	Molec & Cellular Basis of Life	4
IB 270	Evolution of Molecules & Cells	5
IB 271	Organismal Biology	5
IB 372	Ecology and Evolution ¹	5
MATH 220 (Biocalculus section) or MATH 221	Calculus Calculus I	4-5
MATH 231 or IB 494	Calculus II Theoretical Biology and Models²	3-4
Select one group of courses:		8-10
CHEM 202	Accelerated Chemistry I	
CHEM 203	Accelerated Chemistry Lab I	
CHEM 204	Accelerated Chemistry II	

CHEM 205	Accelerated Chemistry Lab II	
OR		
CHEM 102	General Chemistry I ³	
CHEM 103	General Chemistry Lab I	
CHEM 104	General Chemistry II	
CHEM 105	General Chemistry Lab II	
Select one group of courses:		6
CHEM 236	Fundamental Organic Chem I	
CHEM 237	Structure and Synthesis	
OR		
CHEM 232	Elementary Org Chem I	
CHEM 233	Elem Org Chem lab I	
At least six hours of advanced courses in Chemistry ⁴		6-8
MCB 450	Introductory Biochemistry	3
Select one group of courses:		8-13
PHYS 211	Univ. Physics: Mechanics(4Hrs)	
PHYS 212	Univ. Physics: E & M(4Hrs)	
OR		
PHYS 101	College Physics: Mech & Heat (5Hrs)	
PHYS 102	College Physics: E&M & Modern(5Hrs)	
An approved 300- or 400-level course that includes physical/math principles (3-4 hours) ⁵		
An approved 300- or 400-level course in statistics ⁶		3
IB 490 ⁷	Independent Study (2 semesters)	6
300- or 400-level courses in the biological sciences		10

¹ Continuation in the Integrative Biology Honors Concentration requires a grade of B or better in each of IB 270, IB 271, and IB 372 and a 3.0 overall cumulative GPA.

² If IB 494 is taken instead of Math 231, it will not count towards the requirement of 10 hours of 300- or 400-level courses in the biological sciences.

³ Introductory chemistry should be completed prior to enrolling in IB 270.

⁴ Recommended courses are: CHEM 312, CHEM 332, CHEM 360, CHEM 437, CHEM 440. Students should discuss alternate choices with the IB advising office. To earn the Chemistry minor students must choose 3 or 4 hour Chemistry courses, excluding research or independent study.



⁵ Recommended courses are: ATMS421, ANSC448, MCB432 or IBH Director approved.


⁶ NRES 421 is recommended. Other suitable courses are CPSC 440 or STAT 400

⁷ Independent study equivalent to IB490 in non-IB programs must first be approved by Director of IBH Concentration

CLEARANCES:

Signatures:

Unit Representative:		Date:	
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College Representative:

4-13-16
Date:

Appendix A: Proposed Curriculum Revisions

Current Requirements:	Current Hours	Proposed Requirements:	Revised Hours
<i>Major Core Requirement</i>		<i>Major Core Requirement</i>	
IB 150- Organismal & Evolutionary Biol	4	IB 150- Organismal & Evolutionary Biol	4
MCB 150- Molec & Cellular Basis of Life	4	MCB 150- Molec & Cellular Basis of Life	4
IB 270- Evolution of Molecules & Cells	5	IB 270- Evolution of Molecules & Cells	5
IB 271- Organismal Biology	5	IB 271- Organismal Biology	5
IB 372- Ecology and Evolution	5	IB 372- Ecology and Evolution	5
MATH 220 or MATH 221	4-5	MATH 220 (Biocalculus section) or MATH 221	4-5
MATH 231 Calculus II	3 Hours	MATH 231 Calculus II or IB 494 Theoretical Biology + Models	3 -4
MATH 241 Calculus III	4 Hours		
Select one group of courses:	14-16	Select one group of courses:	8-10
CHEM 202, 203, 204, 205, 236, 237		CHEM 202, 203, 204, 205	
OR		OR	
CHEM 102, 102, 104, 105, 236, 237		CHEM 102, 102, 104, 105	
		Select one group of courses:	6
		CHEM 236 and 237	
		OR	
		CHEM 232 and 233	
MCB 450- Introductory Biochemistry	3	MCB 450- Introductory Biochemistry	3
BIOC 455 Technqs Biochem & Biotech	4 Hours		
		At least 6 hours of advanced chemistry courses	6 -8
Select one group of course	8-12	Select one group of course	8-13
PHYS 211 and 212		PHYS 211 and 212	
Or		Or	
PHYS 101 and 102 and one 400-level course in biological or earth systems modeling		PHYS 101 and 102 and one 400-level course in biological or earth systems modeling	
An approved 300- or 400-level course in statistics	3	An approved 300- or 400- level course in statistics	3
IB 490-Independent Study (2 semesters)	6	IB 490-Independent Study (2 semesters)	6

300- or 400- level courses in the biological sciences	10	300- or 400- level courses in the biological sciences	10
Total Core Required Hours	82-89 Hours	Total Core Required Hours	80-91 Hours

Appendix B:
Letter of Support from Chemistry

Resent-Date: Fri, 13 Nov 2015 13:11:16
 From: "Silverman, Scott K" <sks@illinois.edu>
 To: "Augspurger, Carol K" <carolaug@illinois.edu>
 Subject: IB Honors coursework recommendations and CHEM courses

Dear Carol,

I am writing on behalf of the Department of Chemistry to verify that you and I have been in close communication regarding what the IB Honors major will require of its own students and how this relates to Chemistry courses. We have discussed extensively the possible requirements, culminating in your formulation of the currently proposed requirements. These requirements include recommending CHEM 312, CHEM 332, CHEM 360, CHEM 437 and CHEM 440 to the IB Honors majors, who will also be required by you to take MCB 450.

Here I verify that Chemistry should be able to accommodate all IB Honors majors in the four mentioned CHEM lecture courses (312, 332, 360, and 440) under your new IB Honors requirements. Some current IB Honors majors already take these CHEM courses, and therefore the enrollment changes should be minimal: likely only 5 or so new enrolled students per course offering. We should also be able to accommodate the occasional IB Honors major who wants to take the CHEM 437 laboratory course.

Best wishes,
 Scott

Scott K. Silverman
 Professor of Chemistry and Associate Head of Budget and Operations
 140 Roger Adams Laboratory
 Department of Chemistry, Box 57-5
 University of Illinois at Urbana-Champaign
 600 South Mathews Avenue
 Urbana, IL 61801
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Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820



April 13, 2016

Bettina Francis, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Francis:

Enclosed is a copy of a proposal from the College of Liberal Arts and Sciences to revise the BSLAS in Integrative Biology – Integrative Biology Honors concentration.

Sincerely,

A handwritten signature in cursive script that reads 'Kathryn A. Martensen'.

Kathryn A. Martensen
Assistant Provost

Enclosures

c: K. Carney
A. Elli
C. Augspurger
C. Caceres

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

College of Liberal Arts and Sciences
Office of the Dean

2090 Lincoln Hall
702 S. Wright Street, MC-448
Urbana, IL 61801



April 13, 2016

Kathryn Martensen
Associate Provost
Office of the Provost and Vice Chancellor for Academic Affairs
207 Swanlund Administration Building
MC-304

Dear Kathy:

The Committee on Courses and Curricula on behalf of the Faculty of the College of Liberal Arts and Sciences has voted to approve the following proposal:

Revision of the BSLAS in Integrative Biology- Integrative Biology Honors concentration

Please address all correspondence concerning this proposal to me. This proposal is now ready for review by the Senate Educational Policy Committee for proposed implementation in Fall 2016.

Sincerely,



Karen M. Carney
Associate Dean

enclosure

C: Professor Carol Augspurger
Professor Carla Cáceres