



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Revision of the BS in Biochemistry, Department of Biochemistry, School of MCB, College of LAS.

SPONSOR: Milan Bagchi, Interim Head, Department of Biochemistry, 217/333-3945, mbagchi@illinois.edu; Rudy Fratti, Associate Head and Director of Undergraduate Studies, Department of Biochemistry, 217/244-5513, rfratti@illinois.edu.

COLLEGE CONTACT: Kelly Ritter, Associate Dean, College of Liberal Arts & Sciences, 217/333-1350, ritterk@illinois.edu.

BRIEF DESCRIPTION: Increase the required hours of math/statistics courses by adding STAT 212- Biostatistics. Replace BIOC 445 Current Topics in Biochemistry with BIOP 401 Introduction to Biophysics. Remove PHYS 214 from the sequence of physics courses.

JUSTIFICATION:

BIOP 401 is a course that was previously offered by the Department of Biochemistry that laid dormant due to lack of faculty to teach it properly. It will cover several aspects of Quantum Physics (Physics 214) as well as some special topics (BIOC 445) which renders those courses not necessary for the Biochemistry degree. We have submitted a request to discontinue BIOC 445. STAT 212 will be added as a valuable course in the field of Biochemistry. These changes will increase the major requirements by 3 hours.

BUDGETARY AND STAFF IMPLICATIONS:

Resources

- 1)
 - a. **How does the unit intend to financially support this proposal?** BIOP 401 would replace BIOC 445 instructor load and the department head in Statistics approved Biochemistry students to take STAT 212. There should be no extra cost for these changes.
 - b. **Additional staff and dollars needed:** None.
 - c. **How will the unit create capacity or surplus to appropriately resource this program?** There is no need to create more. We are using current

resources for the changes. **If applicable, what functions or programs will the unit no longer support to create capacity?** None.

- d. **Will the unit need to seek campus or other external resources?** No. **If so, please provide a summary of the sources and an indication of the approved support.** None.
- e. **Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.** N/A

2) Resource Implications

- a. **Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.** – None. We are using current resources for the changes. **Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units.** The Department of Statistics will see an increase in the number of students enrolling in STAT 212 (possibly 60 freshmen each year). Jeff Douglas, Statistics Acting Chair, has indicated that they will be able to accommodate these students. See enclosed email string.
- b. **Please address the impact on the University Library.** N/A
- c. **Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.).** None.

DESIRED EFFECTIVE DATE: Fall 2019

STATEMENT FOR ACADEMIC CATALOG:

Major in Biochemistry (Specialized Curriculum)

The typical program of courses required to satisfy this degree totals 126-131 hours as outlined below including up to 12 hours of non-primary language (if not completed in high school); in no case will a program totaling less than 120 hours qualify for graduation. To graduate there is a minimum 2.0 cumulative academic grade point average and student must attain a 2.5 academic grade point average in the chemistry, biochemistry, biology, mathematics, physics and advanced electives in science/engineering courses specified in this curriculum. All proposals for course substitutions must be approved by the academic advisor. This curriculum is intended for those students who desire a rigorous education in chemistry, biochemistry, and biology and the opportunity to engage in undergraduate research and whose career objectives include graduate school, MD/PhD programs, or industry.

E-mail: biocug@mcb.uiuc.edu

Web address for department: <http://mcb.illinois.edu/departments/biochemistry>

All students must complete the [General education](#) requirements including the campus general education language requirement.

Minimum hours required for graduation: 120 hours

Students who complete the Specialized Curriculum in Biochemistry automatically complete a Chemistry minor. Students earning a degree in the Specialized Curriculum in Biochemistry may not earn a second degree in the Science and Letters Curriculum with a concentration in Molecular and Cellular Biology.

Departmental distinction: A student seeking distinction must satisfy the following:

- Complete a minimum of 6 credit hours of undergraduate research ([BIOC 290](#) and [BIOC 492](#)) with a minimum of 4 credit hours of [BIOC 492](#).
- Earn at least a 3.25 grade-point average.
- Present a senior thesis to the department.


Select one of the following:		8-10
CHEM 202 & CHEM 203 & CHEM 204 & CHEM 205	Accelerated Chemistry I and Accelerated Chemistry Lab I and Accelerated Chemistry II and Accelerated Chemistry Lab II (preferred sequence)	
CHEM 102 & CHEM 103 & CHEM 104 & CHEM 105	General Chemistry I and General Chemistry Lab I and General Chemistry II and General Chemistry Lab II (with advisor approval)	
Organic chemistry, select from:		9-10
CHEM 236 & CHEM 237 & CHEM 436	Fundamental Organic Chem I and Structure and Synthesis and Fundamental Organic Chem II (preferred sequence)	
CHEM 232 & CHEM 233 & CHEM 332	Elementary Organic Chemistry I and Elementary Organic Chem Lab I and Elementary Organic Chem II (with advisor approval)	
Molecular and Cellular Biology		17

MCB 150	Molec & Cellular Basis of Life	
MCB 250	Molecular Genetics	
MCB 251	Exp Techniqs in Molecular Biol	
MCB 252	Cells, Tissues & Development	
MCB 253	Exp Techniqs in Cellular Biol	
MCB 354	Biochem & Phys Basis of Life	
or equivalent as approved by academic advisor		
Physical chemistry, select one group of courses:		7-8
CHEM 440	Physical Chemistry Principles (Biological Perspective Section)	
BIOC 446	Physical Biochemistry (preferred sequence)	
or		
CHEM 442	Physical Chemistry I	
CHEM 444	Physical Chemistry II (with advisor approval)	
Mathematics & Statistics		14-15
STAT 212	Biostatistics	
MATH 220	Calculus	
or MATH 221	Calculus I	
MATH 231	Calculus II	
MATH 241	Calculus III	
Physics, select from: ³		10
PHYS 211 & PHYS 212 & PHYS 213	University Physics: Mechanics and University Physics: Elec & Mag and Univ Physics: Thermal Physics (preferred sequence)	
PHYS 101 & PHYS 102	College Physics: Mech & Heat and College Physics: E&M & Modern (or equivalent as approved by academic advisor (with advisor approval)	
Biochemistry: ⁴		13
BIOC 455	Technqs Biochem & Biotech	
BIOC 460	Biochemistry Senior Seminar	
BIOC 406	Gene Expression & Regulation	
BIOP 401	Introduction to Biophysics	
Select 10 hours of Advanced Science/Technical Electives (may include up to 7 hours of BIOC 492 , Senior Thesis) from approved list. ⁵		10
Nontechnical Requirements: ⁶		variable
General education:		

Foreign language - three semesters of college study (or three years of high school study) in a single foreign language to satisfy the campus foreign language requirement	
Composition I writing requirement to satisfy the campus Composition I requirement	
Advanced Composition writing requirement (BIOC 460 is required)	
Humanities/Arts to satisfy the campus general education requirements	
Social/Behavioral sciences to satisfy the campus general education requirements	
Cultural Studies to satisfy the campus general education requirement	
Electives (not including any credit in satisfaction of the above requirements)	variable

1. *Transfer credit must be approved by an advisor in biochemistry in order to be used to satisfy degree requirements.*
2. *A more detailed description of the requirements is listed in the Biochemistry Curriculum Handbook, available in room 419A of Roger Adams Laboratory.*
3. *[PHYS 213](#) is not required if [CHEM 442/CHEM 444](#) sequence is taken.*
4. *An approved list of current courses will be updated annually in January/February for the coming year. Contact advisor.*
5. *The requirements for the Campus General Education categories of Natural Sciences and Technology and Quantitative Reasoning I are fulfilled through coursework in the curriculum.*

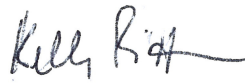
Signatures:



Unit Representative:

11/26/2018

Date:



College Representative:

2-28-19

Date:

Appendix A:

Comparative Table of Proposed Changes

Current Requirements	Current Hours	Proposed Requirements	Proposed Hours
<p>Select one of the following: Accelerated Chemistry I and Accelerated Chemistry Lab I & CHEM 202 & CHEM 203 and Accelerated Chemistry II & CHEM 204 and Accelerated Chemistry Lab II (preferred sequence)</p> <p>OR</p>	8-9	<p>Select one of the following: Accelerated Chemistry I and Accelerated Chemistry Lab I & CHEM 202 & CHEM 203 and Accelerated Chemistry II & CHEM 204 and Accelerated Chemistry Lab II (preferred sequence)</p> <p>OR</p>	8-9
<p>CHEM 102 & CHEM 103 & CHEM 104 & CHEM 105 General Chemistry I and General Chemistry Lab I and General Chemistry II and General Chemistry Lab II (with advisor approval)</p>		<p>CHEM 102 & CHEM 103 & CHEM 104 & CHEM 105 General Chemistry I and General Chemistry Lab I and General Chemistry II and General Chemistry Lab II (with advisor approval)</p>	
<p>Organic chemistry, select from: Fundamental Organic Chem I and Structure and Synthesis and CHEM 236 & CHEM 237 and CHEM 436 Fundamental Organic Chem II (preferred sequence)</p> <p>OR</p>	8-9	<p>Organic chemistry, select from: Fundamental Organic Chem I and Structure and Synthesis and CHEM 236 & CHEM 237 and CHEM 436 Fundamental Organic Chem II (preferred sequence)</p> <p>OR</p>	8-9
<p>CHEM 232 & CHEM 233 & CHEM 332 Elementary Organic Chemistry I</p>		<p>CHEM 232 & CHEM 233 & CHEM 332 Elementary Organic Chemistry I</p>	

and Elementary Organic Chem Lab I and Elementary Organic Chem II (with advisor approval)		and Elementary Organic Chem Lab I and Elementary Organic Chem II (with advisor approval)	
Molecular and Cellular Biology: MCB 150 Molec & Cellular Basis of Life MCB 250 Molecular Genetics MCB 251 Exp Techniqs in Molecular Biol MCB 252 Cells, Tissues & Development MCB 253 Exp Techniqs in Cellular Biol MCB 354 Biochem & Phys Basis of Life or equivalent as approved by academic advisor	17	Molecular and Cellular Biology: MCB 150 Molec & Cellular Basis of Life MCB 250 Molecular Genetics MCB 251 Exp Techniqs in Molecular Biol MCB 252 Cells, Tissues & Development MCB 253 Exp Techniqs in Cellular Biol MCB 354 Biochem & Phys Basis of Life or equivalent as approved by academic advisor	17
Physical chemistry, select one group of courses: CHEM 440 Physical Chemistry Principles (Biological Perspective Section) BIOC 446 Physical Biochemistry (preferred sequence) or CHEM 442 Physical Chemistry I CHEM 444 Physical Chemistry II (with advisor approval)	7-8	Physical chemistry, select one group of courses: CHEM 440 Physical Chemistry Principles (Biological Perspective Section) BIOC 446 Physical Biochemistry (preferred sequence) or CHEM 442 Physical Chemistry I CHEM 444 Physical Chemistry II (with advisor approval)	7-8
Mathematics MATH 220 Calculus or MATH 221 Calculus I	11-12	Mathematics & Statistics STAT 212 Biostatistics MATH 220 Calculus	14-15

MATH 231 Calculus II MATH 241 Calculus III		or MATH 221 Calculus I MATH 231 Calculus II MATH 241 Calculus III	
Physics, select from: ³ University Physics: Mechanics and University Physics: Elec & Mag & PHYS 211 & PHYS 212 & PHYS 213 & PHYS 214 and Univ Physics: Thermal Physics and Univ Physics: Quantum Physics (preferred sequence) OR	10-12	Physics, select from: ³ University Physics: Mechanics and University Physics: Elec & Mag & PHYS 211 & PHYS 212 & PHYS 213 and Univ Physics: Thermal Physics (preferred sequence) OR	10
PHYS 101 & PHYS 102 College Physics: Mech & Heat and College Physics: E&M & Modern (or equivalent as approved by academic advisor (with advisor approval)		PHYS 101 & PHYS 102 College Physics: Mech & Heat and College Physics: E&M & Modern (or equivalent as approved by academic advisor (with advisor approval)	
Biochemistry: ⁴ BIOC 455 Technqs Biochem & Biotech BIOC 460 Biochemistry Senior Seminar BIOC 406 Gene Expression & Regulation BIOC 445 Current Topics in Biochemistry	13	Biochemistry: ⁴ BIOC 455 Technqs Biochem & Biotech BIOC 460 Biochemistry Senior Seminar BIOC 406 Gene Expression & Regulation BIOP 401 Introduction to Biophysics	13
Select 10 hours of Advanced Science/Technical Electives (may include up to 7 hours of BIOC 492 , Senior Thesis) from approved list. ⁵	10	Select 10 hours of Advanced Science/Technical Electives (may include up to 7 hours of BIOC 492 , Senior Thesis) from approved list. ⁵	10
Nontechnical Requirements: ⁶ General education:	variable	Nontechnical Requirements: ⁶ General education:	variable

<p>Foreign language - three semesters of college study (or three years of high school study) in a single foreign language to satisfy the campus foreign language requirement</p> <p>Composition I writing requirement to satisfy the campus Composition I requirement</p> <p>Advanced Composition writing requirement (BIOC 460 is required)</p> <p>Humanities/Arts to satisfy the campus general education requirements</p> <p>Social/Behavioral sciences to satisfy the campus general education requirements</p> <p>Cultural Studies to satisfy the campus general education requirement</p> <p>Electives (not including any credit in satisfaction of the above requirements) variable</p>		<p>Foreign language - three semesters of college study (or three years of high school study) in a single foreign language to satisfy the campus foreign language requirement</p> <p>Composition I writing requirement to satisfy the campus Composition I requirement</p> <p>Advanced Composition writing requirement (BIOC 460 is required)</p> <p>Humanities/Arts to satisfy the campus general education requirements</p> <p>Social/Behavioral sciences to satisfy the campus general education requirements</p> <p>Cultural Studies to satisfy the campus general education requirement</p> <p>Electives (not including any credit in satisfaction of the above requirements) variable</p>	
TOTAL HOURS	84-90	TOTAL HOURS	87-91
<p>1. <i>Transfer credit must be approved by an advisor in biochemistry in order to be used to satisfy degree requirements.</i></p> <p>2 <i>A more detailed description of the requirements is listed in the Biochemistry Curriculum Handbook, available in room 419A of Roger Adams Laboratory.</i></p> <p>3 <i><u>PHYS 213</u> is not required if <u>CHEM 442/CHEM 444</u> sequence is taken.</i></p> <p>4 <i>An approved list of current courses will be updated annually in January/February for the coming year. Contact</i></p>		<p>1. <i>Transfer credit must be approved by an advisor in biochemistry in order to be used to satisfy degree requirements.</i></p> <p>2 <i>A more detailed description of the requirements is listed in the Biochemistry Curriculum Handbook, available in room 419A of Roger Adams Laboratory.</i></p> <p>3 <i><u>PHYS 213</u> is not required if <u>CHEM 442/CHEM 444</u> sequence is taken.</i></p> <p>4 <i>An approved list of current courses will be updated annually in January/February for the coming year. Contact</i></p>	

<p><i>advisor.</i></p> <p>5 <i>The requirements for the Campus General Education categories of Natural Sciences and Technology and Quantitative Reasoning I are fulfilled through coursework in the curriculum.</i></p>		<p><i>advisor.</i></p> <p>5 <i>The requirements for the Campus General Education categories of Natural Sciences and Technology and Quantitative Reasoning I are fulfilled through coursework in the curriculum.</i></p>	
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Appendix B
Emails from Statistics and Physics

From: [Michael, Melissa](#)
To: [Eli, Amy Lawrence](#)
Subject: Fwd: STATS 212 question
Date: Monday, March 18, 2019 3:57:24 PM

Begin forwarded message:

From: "Goldberg, Jeffrey Miles" <jmgoldbe@illinois.edu>
Subject: FW: STATS 212 question
Date: October 29, 2018 at 3:32:35 PM CDT
To: "Michael, Melissa" <mmichae@illinois.edu>
Cc: "Goldberg, Jeffrey Miles" <jmgoldbe@illinois.edu>

Melissa,

Here are the responses from the STATS department head(s) - acting and the one on sabbatical.

Jeff Goldberg, MPA
Senior Coordinator of Student Academic Affairs
Department of Biochemistry
University of Illinois
417 Roger Adams Lab, MC-712
600 S. Mathews
Urbana, IL 61801 USA
Phone: 217/244-3149; Fax: 217/333-8920

-----Original Message-----

From: Douglas, Jeffrey A
Sent: Thursday, August 30, 2018 9:04 AM
To: Simpson, Douglas G <dgs@illinois.edu>; Goldberg, Jeffrey Miles <jmgoldbe@illinois.edu>
Subject: RE: STATS 212 question

Jeff,

I am sure we can find ways to take the biochemistry students in 212. Let's stay in touch and think about it prior to Fall 19 registration so that we have enough seats. If you'd like to talk about the course in detail we can do that.

Jeff

-----Original Message-----

From: Simpson, Douglas G
Sent: Wednesday, August 29, 2018 2:55 PM

To: Goldberg, Jeffrey Miles
Cc: Douglas, Jeffrey A; Simpson, Douglas G
Subject: RE: STATS 212 question

Dear Jeff,

I expect they could be accommodated over time as they transition in. I'm copying Jeff Douglas, our Acting Chair this year, since I am on sabbatical leave.

Regards

Doug

Douglas Simpson

Department of Statistics

University of Illinois

www.stat.illinois.edu <<http://www.stat.illinois.edu>>

From: Goldberg, Jeffrey Miles [<mailto:jmgoldbe@illinois.edu>]
Sent: Wednesday, August 29, 2018 3:38 PM
To: Simpson, Douglas G <dgs@illinois.edu>
Cc: Goldberg, Jeffrey Miles <jmgoldbe@illinois.edu>
Subject: STATS 212 question

Dear Professor Simpson,

The Department of Biochemistry is thinking of adding STAT 212 to our curriculum for our undergrads.

Hopefully, it would be effective for the Fall 2019 freshmen class.

We usually have about 60 freshmen each year although my guess is they wouldn't take the course until their sophomore or latest junior year.

Is this arrangement Ok with you?

Thank you and best regards,

Jeff

Jeff Goldberg, MPA

Senior Coordinator of Student Academic Affairs

Department of Biochemistry

University of Illinois

417 Roger Adams Lab, MC-712

600 S. Mathews

Urbana, IL 61801 USA

Phone: 217/244-3149; Fax: 217/333-8920

From: [Michael, Melissa](#)
To: [Elli, Amy Lawrence](#); [Ritter, Kelly Allison](#)
Subject: Fwd: Use of Physics 214 in Biochemistry
Date: Thursday, February 14, 2019 3:56:26 PM

Dear Kelly and Amy,
See below the response from Physics regarding our request to drop PHYS 214.
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Begin forwarded message:

From: "DeMarco, Brian Leeds" <bdemarco@illinois.edu>
Subject: RE: Use of Physics 214 in Biochemistry
Date: February 14, 2019 at 3:11:32 PM CST
To: "Michael, Melissa" <mmichae@illinois.edu>, "Grosse Perdekamp, Matthias" <mgp@illinois.edu>

Hi Melissa,

Thanks for this notification. We acknowledge that you have communicated your plans to us.

Best wishes,

Brian

Dr. Brian DeMarco

Professor of Physics
Associate Head for Undergraduate Programs

University of Illinois
1110 W Green St
Urbana, IL 61801

217 244 9848
217 244 7559 fax
bdemarco@illinois.edu
<http://go.illinois.edu/bdemarco>

From: Michael, Melissa <mmichae@illinois.edu>
Sent: Wednesday, February 13, 2019 4:32 PM
To: Grosse Perdekamp, Matthias <mgp@illinois.edu>; DeMarco, Brian Leeds <bdemarco@illinois.edu>
Subject: Use of Physics 214 in Biochemistry

Dear Professors Perdekamp and DeMarco,
I'm writing on behalf of the School of MCB and our Department of Biochemistry. The Biochemistry Specialized Curriculum undergraduate program has for many years required one of two possible pathways through your introductory physics courses. Biochem majors could choose PHYS 101 and 102 or PHYS 211, 212, 213 and 214. Recently Biochemistry has requested some modifications to the Specialized Curriculum, one of which is dropping the requirement of PHYS 214. The rationale for this is that we are resurrecting Biophysics 401 (BIOP 401) and it will cover a good bit of content currently contained in PHYS 214: Quantum Physics as well as some special topics currently found in BIOC 445 which is also being eliminated from the BIOC specialized curriculum. We are required by LAS to submit documentation that indicates that we have notified you of our requested change and proof that you have acknowledged receipt of this information. This can be accomplished by a reply to this email. Please let me know if you have questions. I'll look forward to hearing back from you that you have received this notice.

Many thanks,

m

Melissa Michael
Director for Core Curriculum
Asst. Director for Undergraduate Instruction
School of Molecular & Cellular Biology
mmichae@illinois.edu



COLLEGE OF LIBERAL ARTS & SCIENCES

Office of the Dean
2090 Lincoln Hall
702 S. Wright St.
Urbana, IL 61801

February 28, 2019

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 to the BS in Biochemistry

This proposal is now ready for review by the Senate Educational Policy Committee for proposed implementation in Fall 2019.

Sincerely,

A handwritten signature in black ink that reads 'Kelly Ritter'.

Kelly Ritter
Associate Dean

enclosures

C: Milan Bagchi
Rudy Fratti
Melissa Michael