APPROVAL FORM FOR

DEGREE PROGRAMS

MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: Arts & Sciences
Department: Chemistry

Contact Person: Whitnee Nettles
Mail Stop: 9573
E-mail: wlw99@msstate.edu

Nature of Change: Modification
Date Initiated: 2/23/2023
Effective Date: Fall 2023

Current Degree Program Name: B.S. in Chemistry
Major: Chemistry
Concentration: A.C.S., Pre-Medical, Pre-Pharmacy

New Degree Program Name: B.S. in Chemistry (no change)
Major: Chemistry (no change)
Concentration: A.C.S., Pre-Medical, Pre-Pharmacy (no change)

Summary of Proposed Changes:

The changes are to align the degree program with modified course names and numbers and to bring the pre-medical and pre-pharmacy concentrations in better alignment with current medical, dental, and pharmacy school requirements.

In this application are modifications to the base B.S. in Chemistry degree, along with all three of our B.S. concentrations (A.C.S., Pre-Medical, Pre-Pharmacy).

Department Head	3-15-23
Director of Academic Quality	3/22/23
Chair, College or School Curriculum Committee	4/17/23
Dean of College or School	4/19/23
Chair, University Committee on Courses and Curricula	
Chair, Graduate Council(if applicable)	
Chair, Deans Council	

1. **CATALOG DESCRIPTION**
   See chart below.

2. **CURRICULUM OUTLINE**

CURRENT Degree Description	PROPOSED Degree Description
Degree: Bachelor of Science Major: Chemistry	No change
The Department of Chemistry offers two degree programs: the *Bachelors* of Science (B.S.) and the *Bachelors* of Arts (B.A.) degrees. A total of 124 hours is required to complete each degree program. Our chemistry degree programs provide an excellent foundation for career paths in graduate school, teaching, medicine, pharmacy, dental, and numerous industry positions. The B.S. degree program offers three additional concentrations: the American Chemical Society (ACS) concentration, the Pre-Medical concentration, and the Pre-Pharmacy concentration. The ACS concentration is designed to prepare graduates for a career in industry or to further their education through graduate studies. The American Chemical Society (ACS) has continually approved the department and its curriculum since 1941, certifying degrees earned by completing the B.S. degree with the ACS concentration. The Pre-Medical concentration is intended to aid students in meeting medical school pre-requisites. This concentration combines required biology courses with specific chemistry courses designed to prepare students for the rigors of medical schools, dental schools, or other professional schools. Our Pre-Medical concentration is based on the pre-requisites required by the University of Mississippi Medical Center (UMMC). The Pre-Pharmacy concentration is designed to meet the pre-requisites for the School of Pharmacy at the University of Mississippi. These requirements mirror those of other pharmacy schools, but students who wish to attend other pharmacy schools should communicate this information to their advisor. The B.A. degree program has a stronger liberal arts emphasis and could serve as a preparation for a secondary teaching career, chemical sales, or further study at a professional school. The Department of Chemistry also offers a M.S. (non-thesis and thesis) and Ph.D. in Chemistry (see the Graduate Catalog for description of programs and requirements for more information on these advanced degrees). Chemistry Minor Requirements Students in other majors may earn a minor in Chemistry by achieving at least a 2.00 average in a total of 22 hours	The Department of Chemistry offers two degree programs: the **Bachelor** of Science (B.S.) and the **Bachelor** of Arts (B.A.) degrees. A total of 124 hours is required to complete each degree program. Our chemistry degree programs provide an excellent foundation for career paths in graduate school, teaching, medicine, pharmacy, dental, and numerous industry positions. The B.S. degree program offers three additional concentrations: the American Chemical Society (ACS) concentration, the Pre-Medical concentration, and the Pre-Pharmacy concentration. The ACS concentration is designed to prepare graduates for a career in industry or to further their education through graduate studies. The American Chemical Society (ACS) has continually approved the department and its curriculum since 1941, certifying degrees earned by completing the B.S. degree with the ACS concentration. The Pre-Medical concentration is intended to aid students in meeting medical school pre-requisites. This concentration combines required biology courses with specific chemistry courses designed to prepare students for the rigors of medical schools, dental schools, or other professional schools. Our Pre-Medical concentration is based on the pre-requisites required by the University of Mississippi Medical Center (UMMC). The Pre-Pharmacy concentration is designed to meet the pre-requisites for the School of Pharmacy at the University of Mississippi. These requirements mirror those of other pharmacy schools, but students who wish to attend other pharmacy schools should communicate this information to their advisor. The B.A. degree program has a stronger liberal arts emphasis and could serve as a preparation for a secondary teaching career, chemical sales, or further study at a professional school. The Department of Chemistry also offers a M.S. (non-thesis and thesis) and Ph.D. in Chemistry (see the Graduate Catalog for description of programs and requirements for more information on these advanced degrees). Chemistry Minor Requirements Students in other majors may earn a minor in Chemistry by achieving at least a 2.00 average in a total of 22 hours of chemistry (CH) courses with 14 of the hours in upper-division courses (3000-4000 level), and a minimum of 11 of the total hours completed at MSU. Students interested in a

of chemistry (CH) courses with 14 of the hours in upper-division courses (3000-4000 level), and a minimum of 11 of the total hours completed at MSU. Students interested in a chemistry minor should contact the Academic Coordinator.	chemistry minor should contact the Academic Coordinator.

CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
English Composition: EN 1103 English Composition I or *EN 1163 Accelerated Composition I* EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3	English Composition: EN 1103 English Composition I or **EN 1104 Expanded English Composition I** EN 1113 English Composition II or EN 1173 Accelerated Composition II	 3 3
Foreign Language: *2 semesters - one Foreign Language (see advisor)*	 *6*	Foreign Language: **Foreign Language I** **Foreign Language II**	 **3** **3**
Humanities: Literature – *see A&S requirements* History – *see A&S requirements*	 3 3	Humanities: Literature– **A&S core** History– **A&S core**	 3 3
Mathematics: *MA 1713 Calculus* MA 1723 Calculus II	 3 3	Mathematics: **MA 1713 Calculus I** MA 1723 Calculus II	 3 3
Fine Arts: *See A&S requirements*	 3	Fine Arts: **A&S core**	 3
Natural Sciences: *See Major Core – Consult advisor for specifics*	 *9-12*	Natural Sciences: **Satisfied within the major**	
Social Sciences: *Must be from 2 different areas and must be selected from University/A&S Core* *PSY 1013 General Psychology (required for pre-medicine)*	 6	Social Sciences: **A&S core** [1]	 6
Major Core Student should check for prerequisites for all courses. See advisor. *Chemistry (42 hours)* CH 1141 Professional Chemistry: Paths CH 1234 Integrated Chemistry I[1] CH 1244 Integrated Chemistry II[2] CH 2141 Professional Chemistry: Tools CH 2311 Analytical Chemistry I Laboratory CH 2313 Analytical Chemistry I CH 3141 Professional Chemistry: Literature CH 4141 Professional Chemistry: Research *CH 4213 Advanced Inorganic Chemistry* CH 4351 Analytical Chemistry Lab II CH 4353 Analytical Chemistry II CH 4554 Integrated Organic Chemistry I[3]	 1 4 4 1 1 3 1 1 3 1 3 4	Major Core Student should check for prerequisites for all courses. See advisor. CH 1141 Professional Chemistry: Paths CH 1234 Integrated Chemistry I [2] CH 1244 Integrated Chemistry II [3] CH 2141 Professional Chemistry: Tools **CH 3311 Analytical Chemistry I Laboratory** **CH 3313 Analytical Chemistry I** CH 3141 Professional Chemistry: Literature CH 4141 Professional Chemistry: Research **CH 3213 Inorganic Chemistry** CH 4351 Analytical Chemistry Laboratory II CH 4353 Analytical Chemistry II CH 4554 Integrated Organic I [4]	 1 4 4 1 1 3 1 1 3 1 3 4

CH 4564 Integrated Organic Chemistry II[4] CH 4711 Senior Seminar	4 1	CH 4564 Integrated Organic II [5] CH 4711 Senior Seminar	4 1
Oral Communication *Requirement*: *Satisfied by successful completion of CH 1141, 2141, 3141, 4141, and 4711.*		Oral Communication: **Satisfied with CH 1141, 2141, 3141, 4141, and 4711 sequence in the major**	
Writing Requirement: *Satisfied by successful completion of CH 3141, 4141, and 4711.*		**Jr/Sr Writing:** **Satisfied with CH 3141, 4141, and 4711 sequence in the major**	
Computer Literacy: *Satisfied by successful completion of CH 1141, 2141, 2313, 3141, 4141, 4351, and 4711.*			
[1] CH 1234 can be replaced by CH 1213 and CH 1211. [2] CH 1244 can be replaced by CH 1223 and CH 1221. [3] CH 4554 can be replaced by CH 4513 and CH 4511. [4] CH 4564 can be replaced by CH 4523 and CH 4521.		**Note: Students must complete 31 upper division hours in A&S in residence at MSU.** **[1] Social Science courses must cover two disciplines and come from A&S core; students in Pre-Medicine concentration must take PSY 1013; students in Pre-Pharmacy concentration who plan to attend the University of Mississippi School of Pharmacy should take EC 2123.** [2] CH 1234 can be replaced by CH 1213 and CH 1211. [3] CH 1244 can be replaced by CH 1223 and CH 1221. [4] CH 4554 can be replaced by CH 4513 and CH 4511. [5] CH 4564 can be replaced by CH 4523 and CH 4521.	
Choose one of the following paths to complete the B.S. degree:		Choose one of the following paths to complete the B.S. degree:	
B.S. with Non-ACS Certification *Choose one of the following:* CH 4413 Thermodynamics and Kinetics & CH 4411 Physical Chemistry Laboratory I CH 4423 Quantum Mechanics and Spectroscopy & CH 4421 Physical Chemistry Laboratory II CH 4403 Biophysical Chemistry & CH 4411 Physical Chemistry Laboratory I CH 4403 Biophysical Chemistry & CH 4421 Physical Chemistry Laboratory II Chemistry *Elective* [1]	*4* 6	B.S. with Non-ACS Certification **CH 4403 Biophysical Chemistry** **or CH 4413 Thermodynamics and Kinetics** **or CH 4423 Quantum Mechanics and Spectroscopy** **CH 4411 Physical Chemistry Lab I** **or CH 4421 Physical Chemistry Lab II** **CH Electives [6]**	**3** **1** 6

PH 2213 Physics I or PH 1113 General Physics I PH 2223 Physics II or PH 1123 General Physics II PH 2233 Physics III or PH 1133 General Physics III	3 3 3	PH 2213 Physics I or PH 1113 General Physics I PH 2223 Physics II or PH 1123 General Physics II PH 2233 Physics III or PH 1133 General Physics III	3 3 3
General Electives *Number of credit hours needed to bring the total number of credit hours to 124. Consult advisor.*		**General Electives- consult advisor**	**40**
Total Hours	124	Total Hours	**124**
[1] Advisor approved chemistry or biochemistry courses 3000-level and above.		**[6] Advisor-approved CH or BCH upper division courses.**	
A.C.S. concentration		A.C.S. concentration	
CH 3213 Inorganic Chemistry *CH 4312 Advanced Inorganic Lab* *CH 4413 Thermodynamics and Kinetics* *CH 4411 Physical Chemistry Lab I* *CH 4423 Quantum Mechanics and Spectroscopy* *CH 4421 Physical Chemistry Lab II* *CH 4603 Undergraduate Research*	*3* *2* *3* *1* *3* *1* *3*	**CH 3212 Inorganic Chemistry Lab** **CH 4411 Physical Chemistry Lab I** **CH 4413 Thermodynamics and Kinetics** **or CH 4403 Biophysical Chemistry** **CH 4421 Physical Chemistry Lab II** **CH 4423 Quantum Mechanics and Spectroscopy**	**2** **1** **3** **1** **3**
BCH 4603 General Biochemistry	3	BCH 4603 General Biochemistry I **BCH 4613 General Biochemistry II** **or CH 4213 Advanced Inorganic Chemistry** **CH 4800 Undergraduate Research** **CH Electives[6]**	3 **3** **3** **1**
PH 2213 Physics I PH 2223 Physics II PH 2233 Physics III MA 2733 Calculus III	3 3 3 3	PH 2213 Physics I PH 2223 Physics II PH 2233 Physics III MA 2733 Calculus III	3 3 3 3
		General Electives- consult advisor	**27**
General Electives *Number of credit hours needed to bring the total number of credit hours to 124. Consult advisor.*		Total Hours **[6] Advisor-approved CH or BCH upper division courses.**	124
Total Hours	124		

Pre-Medical concentration Student should check for prerequisites for all courses. See advisor.		Pre-Medical concentration Student should check for prerequisites for all courses. See advisor.	
CH 4403 Biophysical Chemistry *& CH 4411 Physical Chemistry Laboratory I*	*4*	**CH 4403 Biophysical Chemistry** **or CH 4413 Thermodynamics and Kinetics** **or CH 4423 Quantum and Spectroscopy**	**3**
		CH 4411 Physical Chemistry Lab I **or CH 4421 Physical Chemistry Lab II**	**1**
		CH Elective	**1**
BCH 4603 General Biochemistry I	3	BCH 4603 General Biochemistry I	3
BCH 4613 General Biochemistry II	3	BCH 4613 General Biochemistry II	3
PH 2213 Physics I or PH 1113 General Physics I	3	PH 2213 Physics I or PH 1113 General Physics I	3
PH 2223 Physics II or PH 1123 General Physics II	3	PH 2223 Physics II or PH 1123 General Physics II	3
PH 2233 Physics III or PH 1133 General Physics III	3	PH 2233 Physics III or PH 1133 General Physics III	3
Technical and General Electives			
BIO 1134 Biology I	4	BIO 1134 Biology I	4
BIO 1144 Biology II	4	BIO 1144 Biology II	4
BIO 2103 Cell Biology *or BCH 4713 Molecular Biology*	*3*	**BIO 2103 Cell Biology**	**3**
BIO 3304 General Microbiology	*4*		
BIO 3103 Genetics I *or BIO 4133 Human Genetics*	*3*		
BIO 3504 Comparative Anatomy	*4*	**BIO 3004 Human Anatomy**	**4**
BIO 4413 Immunology	*3*		
BIO 4514 Animal Physiology	*4*	**BIO 3014 Human Physiology**	**4**
General Electives *Number of credit hours needed to bring the total number of credit hours to 124. Consult advisor.*		**General Electives- consult advisor[6]**	**20**
Total Hours	124	Total Hours	124
		[6]Recommended Electives: BIO 3304 General Microbiology; BIO 3103 Genetics I or BIO 4133 Human Genetics; BIO 4413 Immunology; MA/ST 2113 Introduction to Statistics or MA/ST 3123 Introduction to Statistical Inference	

Pre-Pharmacy Concentration *Required Courses*		Pre-Pharmacy Concentration	
CH 1213 Chemistry I [1]	*3*	**CH 4403 Biophysical Chemistry**	**3**
CH 1211 Investigations in Chemistry I [1]	*1*	**or CH 4413 Thermodynamics and Kinetics**	
CH 1223 Chemistry II [2]	*3*	**or CH 4423 Quantum Mechanics and Spectroscopy**	
CH 1221 Investigations in Chemistry II [2]	*1*		
CH 4513 Organic Chemistry I [3]	*3*	**CH 4411 Physical Chemistry Lab I**	**1**
CH 4511 Organic Chemistry Laboratory I [3]	*1*	**or CH 4421 Physical Chemistry Lab II**	
CH 4523 Organic Chemistry II [4]	*3*		
CH 4521 Organic Chemistry Laboratory II [4]	*1*	**CH Elective**	**1**
BCH 4603 General Biochemistry I	3	BCH 4603 General Biochemistry I	3
		BCH 4613 General Biochemistry II	**3**
BIO 1134 Biology I	4	BIO 1134 Biology I	4
BIO 1144 Biology II	4	BIO 1144 Biology II	4
BIO 3014 Human Physiology	4	**BIO 2103 Cell Biology**	**3**
BIO 3304 General Microbiology	4	**BIO 3004 Human Anatomy**	**4**
BIO 4405 Pathogenic Microbiology	*5*	BIO 3014 Human Physiology	4
BIO 3103 Genetics I *or BIO 4133 Human Genetics*	*3*	BIO 3304 General Microbiology	4
PHI 3323 Medical Ethics	*3*		
EN 1103 English Composition I	*3*		
EN 1113 English Composition II	*3*		
ST 2113 Introduction to Statistics	*3*		
MA 1713 Calculus I	*3*		
PH 1113 General Physics I	*3*	**PH 2213 Physics I**	**3**
PH 1123 General Physics II	*3*	**or PH 1113 General Physics I**	
		PH 2223 Physics II	**3**
		or PH 1123 General Physics II	
		PH 2233 Physics III	**3**
		or PH 1133 General Physics III	
		MA/ST 2113 Introduction to Statistics	**3**
		or MA/ST 3123 Introduction to Statistical Inference	
CO 1003 Fundamentals of Public Speaking	3	CO 1003 Fundamentals of Public Speaking	3
EC 2123 Principles of Microeconomics	*3*		
Electives		**Advisor approved electives**[6]	**10**
Social and Behavioral Science Electives [5]	*6*		
Humanities and Fine Arts Electives [6]	*9*		
General Electives *To bring the total number of credit hours up to 92*		**Total Hours**:	**124**
[1] CH 1213 and CH 1211 can be replaced by CH 1234		**Note: University of Mississippi School of Pharmacy requires EC 2123, ST 2113, and CO 1003.**	
[2] CH 1223 and CH 1221 can be replaced by CH		**[6]Recommended electives: PHI 3323 Medical**	

1244 *[3] CH 4513 and CH 4511 can be replaced by CH 4554* *[4] CH 4523 and CH 4521 can be replaced by CH 4564* *[5] At MSU EC 2113 Principles of Macroeconomics is a pre-requisite for the required course EC 2123 (see above), and EC 2113 will count as one social science elective. In addition to EC 2113 one course from either Psychology, Sociology, Political Science, or Anthropology is required.* *[6] At least 3 credit hours required in each of the two main areas. Humanities Electives should be chosen from the areas: English Literature, Foreign Language, History, Religion or Philosophy*		**Ethics; BIO 3103 Genetics I or BIO 4133 Human Genetics; BIO 4413 Immunology; BIO 4405 Pathogenic Microbiology**	

3. JUSTIFICATION AND LEARNING OUTCOMES

The Department of Chemistry is seeking to change the number for Analytical I Lecture, Analytical Lab I, and Advanced Inorganic Lab to better reflect the rigor of these courses. In addition, the name for Advanced Inorganic Lab is being changed to Inorganic Chemistry Lab. In addition, we are seeking to add more clarity and flexibility in our concentrations for our chemistry majors.

4. LETTER OF SUPPORT

See attached.

5. PROPOSED 4-LETTER ABBREVIATION

CHEM (no change required)

6. EFFECTIVE DATE

Fall 2023

MISSISSIPPI STATE UNIVERSITY

Department of Chemistry
P.O. Box 9573
310 President Circle
1115 Hand Lab
Mississippi State, MS 39762

P. 662.325.3584
F. 662.325.1618
www.chemistry.msstate.edu

March 10, 2023

Dr. Andy Perkins
Chair, University Committee on Courses and Curricula
Professor, Associate Department Head

Dear Dr. Perkins,

The faculty of the Department of Chemistry have reviewed and approved the proposed curriculum updates for our B.A. and B.S. degree plans.

We, the Department of Chemistry Undergraduate Affairs Committee request that the University Committee on Courses and Curricula (UCCC) approve these changes.

Sincerely,

Whitnee Nettles
Assistant Clinical Professor and
Head of Curriculum Committee

Edwin Webster
Professor
Committee Member

Steven Gwaltney
Professor
Committee Member

Eric Dornshuld
Assistant Clinical Professor
Committee Member

Teresa Brown
Instructor/Lab Coordinator
Committee Member

MISSISSIPPI STATE UNIVERSITY

COLLEGE OF ARTS & SCIENCES
DEPARTMENT OF BIOLOGICAL SCIENCES

P.O. Box GY
295 E Lee Blvd
Mississippi State, MS 39762

P. 662.325.3120
F. 662.325.7939
www.biology.msstate.edu

Giselle Thibaudeau, PhD
Professor and Interim Department Head
Department of Chemistry

April 12, 2023

Dear Dr. Thibaudeau,

I am writing this letter in support of the Department of Chemistry's request to add new concentrations to your BA and BS degree programs. Although these proposals include the BIO courses you note (BIO 1134, 1144, 2103, 3004, and 3014), after discussion with our BIO advising staff, we agree that any additional students can be accommodated in our regular offerings for these courses without changes.

Sincerely,

Angus Dawe Digitally signed by Angus Dawe
Date: 2023.04.12 15:34:00 -05'00'

Angus L. Dawe, Ph.D.
Department Head & Professor

dawe@biology.msstate.edu 662.325.7577 217 Harned Hall

MISSISSIPPI STATE UNIVERSITY.

COLLEGE OF AGRICULTURE & LIFE SCIENCES
Department of Biochemistry, Molecular Biology,
Entomology and Plant Pathology
P. O. Box 9655
Mississippi State, MS 39762
P. 662.325.2640
biochemistry.msstate.edu

Mar. 13, 2023

MEMORANDUM

TO: University Committee on Courses and Curricula

FROM: Biochemistry, Molecular Biology, Entomology, and Plant Pathology (BCH-EPP) Curriculum Committee

Re: Letter of support for the chemistry curriculum modifications

The BCH-EPP Curriculum Committee has reviewed the proposal on degree curriculum modifications from the Department of Chemistry, which proposes to 1) add BCH 4603 and BCH 4613 as concentration courses for B.A. Pre-health concentration and electives for B.A. without concentration; 2) add BCH 4603 as required and BCH 4613 as an elective for B.S. ACS degree; 3) add both BCH 4603 and BCH 4613 as concentration courses for both B.S. Pre-Pharmacy and B.S. Pre-Medical concentrations; and 4) add both BCH 4603 and BCH 4613 as electives for B.S. without concentration. It is believed that the additions will enrich the curricula of the chemistry programs.

Regards,

Digitally signed by Shien Lu
DN: cn=Shien Lu, o=Mississippi State University, ou, email=sl332@msstate.edu, c=US
Date: 2023.03.13 15:55:05 -05'00'

Shien Lu, Ph.D.
Professor and Committee Chair
sl332@plantpath.msstate.edu

John J. Riggins
Digitally signed by John J. Riggins
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John J. Riggins, Ph.D.
Professor
jriggins@entomology.msstate.edu

Aswathy Rai
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Aswathy Rai, Ph.D.
Assistant Clinical Professor and Undergraduate Coordinator
aswathy.rai@msstate.edu

Federico G. Hoffmann
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Federico Hoffmann, Ph.D.
Associate Professor
fgh19@msstate.edu

Natraj Krishnan
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Natraj Krishnan, Ph.D.
Associate Professor and Graduate Coordinator
nkrishnan@entomology.msstate.edu