CHEMISTRY CURRICULUM REVISION PROPOSAL

Rationale for Curriculum Revision

- The revised Chemistry BS curriculum meets the new university policy to reduce the total credit hours from 127 to 120.

- The revised Chemistry BS curriculum also meets all ACS BS Chemistry requirements (The revised Chemistry BS curriculum distributes the ACS' required/recommended Macromolecular, Supramolecular, and Nanoscale (**MSN**) and Green Chemistry topics into the existing courses).

CHEMISTRY CURRICULUM REVISION PROPOSAL

Summary

Course Name	Course #	Credit hours (current)	**Credit hours (Proposed)**	Credit hour Change (+/-)
Organic Chemistry Laboratory	CHEM 240	2 (1,4,2)	1 (0,4,1)	-1
Analytical Chemistry	CHEM 247	3 (3,3,3)	4 (3,4,4)	+1
Multivariate and Vector Calculus **And** Introduction to Differential Equations	MATH 251 and MATH 252	8 (4,1,4) and (4,0,4)	4 (4,1,4) **or** (4,0,4)	-4
Spectroscopic Methods in Identification and Analysis	CHEM 434	4 (3,4,4)	0	-4
Undergraduate Seminar	CHEM 451	3 (3,0,3)	2 (2,0,2)	-1
Chemistry Colloquium	CHEM 485	2 (0,1,1) and (0,1,1)	1 (1,0,1)	-1
Introductory Statistics, Introduction to Data Science, or Cheminformatics	MATH 225, DS 151, CHEM 452	0	3 (3,0,3) or 3 (3,0,3) or 3 (3,0,3)	+3
			NET CHANGE	**-7**

Key: (Lecture weekly hours, Lab weekly hours, credits)

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Summary

Reformatting Courses to be just a Lecture or just a Lab:

Key: (Lecture weekly hours, Lab weekly hours, credits)

CHEM 124 Principles of Chemistry I with Laboratory (3,3,4) ⇒ CHEM 122 Principles of Chemistry I (3,0,3) and CHEM 123 Principles of Chemistry I Laboratory (0,4,1)

CHEM 125 Principles of Chemistry II with Laboratory (3,3,4) ⇒ CHEM 126 Principles of Chemistry II (3,0,3) and CHEM 140 Principles of Chemistry II Laboratory (0,4,1)

CHEM 237 Organic Chemistry I (3,4,4) ⇒ CHEM 235 Organic Chemistry I (3,0,3) and CHEM 236 Organic Chemistry I Laboratory (0,4,1)

CHEM 247 Analytical Chemistry (3,3,3) ⇒ CHEM 247 Analytical Chemistry (3,0,3) and CHEM 248 Analytical Chemistry Laboratory (0,4,1)

CHEM 321 Instrumental Analysis (3,4,4) ⇒ CHEM 321 Instrumental Analysis (3,0,3) and CHEM 322 Instrumental Analysis Laboratory (0,4,1)

CHEM 344 Physical Chemistry II (3,4,4) ⇒ CHEM 344 Physical Chemistry II (3,0,3) and CHEM 345 Physical Chemistry II Laboratory (0,4,1)

CHEM 434 Spectroscopic Methods in Identification and Analysis (3,4,4) ⇒ CHEM 434 Spectroscopic Methods in Identification and Analysis (3,0,3) and CHEM 435 Spectroscopic Methods in Identification and Analysis Laboratory (0,4,1)

CHEMISTRY CURRICULUM REVISION PROPOSAL

Summary

Bachelor Science in Chemistry Program Requirements:

Current		Proposed	
Course Number	Credits	Course Number	Credits
Chemistry Requirements	**54**	**Chemistry Requirements**	**48**
CHEM 100	2	CHEM 100	2
CHEM 124	4	CHEM 122	3
		CHEM 123	1
CHEM 125	4	CHEM 126	3
		CHEM 127 (renumbered Chem 140)	1
CHEM 237	4	CHEM 235	3
		CHEM 236	1
CHEM 239	3	CHEM 239	3
CHEM 240	2	CHEM 240	1
CHEM 247	3	CHEM 247	3
		CHEM 248	1
CHEM 321	4	CHEM 321	3
		CHEM 322	1
CHEM 343	3	CHEM 343	3
CHEM 344	4	CHEM 344	3
		CHEM 345	1

CHEMISTRY CURRICULUM REVISION PROPOSAL

Summary

Curriculum Revision Proposal for Three Concentrations (Environmental, Forensic and Medicinal Chemistry)

Highlights and Rationale for Curriculum Revision

- All three concentrations are in compliance with the new university policy with total 120 credit hours required for a BS degree.
- Meets all ACS BS Chemistry requirements (previous specialized majors did not).
- All Chemistry BS requirements are required for each concentration.

The following changes are further made based on the revised 120/121-credit-hour Chemistry BS curriculum described above:

- Add CHEM 463 (Analytical Method Development Laboratory (1,7,3)) to all three concentrations.
- For Environmental Chemistry Concentration: add CHEM 472 (Environmental Chemistry) and CHEM 473 (Environmental Analytical Chemistry).
- For Forensic Chemistry Concentration: add CHEM 475 (Forensic Chemistry) and CHEM 476 (Forensic Chemistry Laboratory).
- For Medicinal Chemistry Concentration: add CHEM 467 (Medicinal Chemistry) and CHEM 456 (Computational Biochemistry and Drug Design).
- The additional requirements for each concentration take up the 6 credits of Chemistry electives and 3 credits of free electives, resulting in 9 hours of free electives.

CHEMISTRY CURRICULUM REVISION PROPOSAL

Summary

ACS recommended that we integrate Macromolecular, Supramolecular, and Nanoscale (MSN) and Green Chemistry topics into the existing courses.

CHEM 100

Introduction to the Profession

Introduction to the chemical sciences, scientific method, computing tools, green chemistry, and interrelations of chemical sciences with biology, physics and other professions.

Lecture: 2 Lab: 0 Credits: 2

Satisfies: Communications (C)

Bachelor of Science in Chemical Engineering Curriculum

YEAR 1			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
CHE 100	2	CHE 101	2
MATH 151	5	MATH 152	5
CHEM 125[1]	4	PHYS 123	4
CS 104 or 105	2	Social Sciences Elective	3
Humanities 200-level Course	3	Humanities or Social Sciences Elective	3
	16		**17**
YEAR 2			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
CHE 202	3	CHE 239	3
MATH 252	4	CHE 301	3
CHEM 237	4	MATH 251	4
PHYS 221	4	CHEM 239	3
Humanities Elective (300+)	3	CHEM 343	3
	18		**16**

Bachelor of Science in Biology Curriculum

YEAR 1			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
BIOL 100	2	BIOL 115	3
BIOL 107	3	BIOL 117	1
BIOL 109	1	CHEM 125	4
CHEM 124	4	MATH 152	5
MATH 151	5	Humanities 200-level Course	3
	15		**16**
YEAR 2			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
BIOL 214	3	BIOL 210	3
CHEM 237	4	BIOL 225	2
PHYS 123	4	CHEM 239	3
Social Sciences Elective	3	PHYS 221	4
Humanities or Social Sciences Elective	3	Humanities Elective (300+)	3
	17		**15**

Bachelor of Science in Physics Curriculum

YEAR 1			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
PHYS 100	2	PHYS 221	4
PHYS 123	4	CHEM 125	4
CHEM 124	4	MATH 152	5
MATH 151	5	Humanities or Social Sciences Elective	3
	15		**16**
YEAR 2			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
PHYS 223	4	PHYS 240	3
MATH 251	4	PHYS 304	3
CS 105 or 115	2	MATH 252	4
Social Sciences Elective	3	Social Sciences Elective (300+)	3
Humanities 200-level Course	3	Social Sciences Elective (300+)	3
	16		**16**

Bachelor of Science in Biomedical Engineering: Medical Imaging Track Curriculum

YEAR 1			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
BME 100	2	CHEM 125	4
CHEM 124	4	MATH 152	5
CS 104	2	PHYS 123	4
MATH 151	5	Social Sciences Elective	3
Humanities 200-level Course	3		
	16		**16**
YEAR 2			
SEMESTER 1	**CREDIT HOURS**	**SEMESTER 2**	**CREDIT HOURS**
CS 201	4	BIOL 115	3
ECE 211	3	BIOL 117	1
MATH 252	4	BME 315	2
PHYS 221	4	ECE 213	4
		MATH 251	4
		Humanities Elective (300+)	3
	15		**17**

Committee Members

Analytical – Diep Nguyen
Inorganic – Adam Hock
Organic – Katie Leight
Physical – Ben Zion