DEPARTMENT OF
HIGHER EDUCATION &
WORKFORCE DEVELOPMENT

New Program Report

Date Submitted:
12/15/2020

Institution
Missouri Western State University

Site Information

Implementation Date:
1/19/2021 12:00:00 AM

Added Site(s):

Selected Site(s):

Missouri Western State University, 4525 Downs Drive, St. Joseph, MO, 64507

CIP Information

CIP Code:
260202

CIP Description:
A program that focuses on the scientific study of the chemistry of living systems, their fundamental chemical substances and reactions, and their chemical pathways and information transfer systems, with particular reference to carbohydrates, proteins, lipids, and nucleic acids. Includes instruction in bio-organic chemistry, protein chemistry, bioanalytical chemistry, bioseparations, regulatory biochemistry, enzymology, hormonal chemistry, calorimetry, and research methods and equipment operation.

CIP Program Title:
Biochemistry

Institution Program Title:
Biochemistry and Molecular Biology

Degree Level/Type

Degree Level:
Bachelor's Degree

Degree Type:
Bachelor of Science

Options Added:

With certification

Without certification

Collaborative Program:
N

Mode of Delivery

Current Mode of Delivery

Classroom

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Student Preparation

Special Admissions Procedure or Student Qualifications required:
No special preparation is required.

Specific Population Characteristics to be served:
n/a

Faculty Characteristics

Special Requirements for Assignment of Teaching for this Degree/Certificate:
Ph.D. or Masters degree in Chemistry or a closely related field for Chemistry content coursework.
Ph.D. or Masters degree in Biology or a closely related field for Biology content coursework.

Estimate Percentage of Credit Hours that will be assigned to full time faculty:
100%

Expectations for professional activities, special student contact, teaching/learning innovation:
Faculty are expected to engage in scholarly work including research and pedagogical innovation that leads to peer-reviewed presentation and publication of the work. Faculty research is expected to engage undergraduate students in this program wherever possible.

Student Enrollment Projections Year One-Five

Year 1	**Full Time:** 33	**Part Time:** 0	
Year 2	**Full Time:** 43	**Part Time:** 0	
Year 3	**Full Time:** 40	**Part Time:** 0	**Number of Graduates:** 10
Year 4	**Full Time:** 40	**Part Time:** 0	
Year 5	**Full Time:** 40	**Part Time:** 0	**Number of Graduates:** 10

Percentage Statement:
25.00

Program Accreditation

Institutional Plans for Accreditation:
The current BS Biochemistry & Molecular Biology Degree offers a path to ACS Certification in Biochemistry that is currently certified by the American Chemical Society. The curricular revision proposed herein would continue to maintain that certification.

Program Structure

Total Credits:
120

Residency Requirements:
n/a

General Education Total Credits:
42

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Major Requirements Total Credits:
75

Course(s) Added

COURSE NUMBER	CREDITS	COURSE TITLE
BIO 205	4	Genetics

Free Elective Credits:
18

Internship or other Capstone Experience:
None

Assurances

I certify that the program is clearly within the institution's CBHE-approved mission. The proposed new program must be consistent with the institutional mission, as well as the principal planning priorities of the public institution, as set forth in the public institution's approved plan or plan update.

I certify that the program will be offered within the proposing institution's main campus, CBHE-approved service region or CBHE-approved off-site location.

I certify that the program will not unnecessarily duplicate an existing program within the geographically applicable area.

I certify that the program will build upon existing programs and faculty expertise.

I certify that the program can be launched with minimal expense and falls within the institution's current operating budget.

I certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

Contact Information

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This program is a curriculum revision of an existing program, [BS-Biochemistry & Molecular Biology], that we currently offer. The submitted revision, which equals the four course change guideline, is the product of faculty's effort to better streamline, reduce redundancy, and define course offerings. The revised program will utilize current faculty and resources and will not require additional expenditures beyond what is already allocated for the existing program.

2020-2021 CURRENT CURRICULUM

Degree/Program:	B.S. – Biochemistry & Molecular Biology
Major:	Biochemistry & Molecular Biology

MAJOR REQUIREMENTS		(77 - 81 Credits)	
		Credit	Grade
BIO105	Principles of Organismal Biology	4	
BIO106	Principles of Cell Biology	4	
BIO205	Genetics	4	
BIO225	Ecology	4	
BIO310 BIO430	Molecular Cell Biology Molecular Basis of Disease	OR 4	
CHE111	General Chemistry I	5	
CHE120	General Chemistry II w/ Qual Analy	5	
CHE310	Organic Chemistry I	3	
CHE311	Organic Chemistry Lab I	2	
CHE321	Quantitative Analysis	4	
CHE340 CHE383/84	Physical Chem for the Bio. Sciences Physical Chem: Thermodynamics Lec/Lab	OR 4-5	
CHE370	Biochemistry	4	
CHE470	Biochemistry II	3	
CHE495	Seminar in Chemistry	2	
PHY110/111 PHY210/211	College Physics I/II University Physics I/II	OR 8-10	
MAT165 MAT166 MAT167	Calc w/ Analytic Geom I: Diff(3) Calc w/ Analytic Geom I: Integ (3) Calculus w/ Analytic Geometry I (5)	AND OR 5-6	
	TOTAL	65-69	

ELECTIVES (Complete a minimum of twelve (12) credits from Biology and/or Chemistry courses numbered 300 or higher:			
	TOTAL	12	

Students in this program may opt to complete the requirements for certification of their degree by the American Chemical Society by taking the appropriate coursework. The current requirements for this option are found below.

Degree/Program:	B.S. – Biochemistry & Molecular Biology
Major:	Biochemistry & Molecular Biology
Concentration:	ACS Certification

MAJOR REQUIREMENTS		(87-89 Credits)	
		Credit	Grade
BIO105	Principles of Organismal Biology	4	
BIO106	Principles of Cell Biology	4	
BIO205	Genetics	4	
BIO225	Ecology	4	
BIO310 BIO430	Molecular Cell Biology Molecular Basis of Disease	OR 4	
CHE111	General Chemistry I	5	
CHE120	General Chemistry II w/ Qual Analy	5	
CHE310	Organic Chemistry I	3	
CHE311	Organic Chemistry Lab I	2	
CHE321	Quantitative Analysis	4	
CHE383/384	Physical Chem: Therm & Kinetics/Lab	5	
CHE370	Biochemistry I	4	
CHE470	Biochemistry II	3	
CHE495	Seminar in Chemistry	2	
PHY210/211	University Physics I/II	10	
MAT165 MAT166 MAT167	Calc w/ Analytic Geom I: Diff(3) Calc w/ Analytic Geom I: Integ (3) Calculus w/ Analytic Geom I (5)	AND OR 5-6	
	TOTAL	68-69	

ACS (American Chemical Society) Certification courses:			
CHE312/313	Organic Chemistry II/Lab	5	
CHE326 CHE426	Instrumental Analysis (4) Instrumental Methods (5)	OR 4-5	
CHE381/382	P-Chem: Quantum Mechanics/Lab	4	
CHE441	Advanced Inorganic Chemistry	3	
MAT 177	Calculus w/Analytic Geom II	3	
	TOTAL	19-20	

2021-2022 PROPOSED CURRICULUM

The proposed curriculum has been reviewed and approved by faculty and University Administration

Degree/Program:	B.S. – Biochemistry & Molecular Biology
Major:	Biochemistry & Molecular Biology

MAJOR REQUIREMENTS		(75 Credits)	
		Credit	Grade
BIO105	Principles of Organismal Biology	4	
BIO106	Principles of Cell Biology	4	
BIO205	Genetics	4	
BIO225	Ecology	4	
BIO310 BIO430	Molecular Cell Biology Molecular Basis of Disease	OR 4	
CHE111	General Chemistry I	5	
CHE120	General Chemistry II w/ Qual Analy	5	
CHE310	Organic Chemistry I	3	
CHE311	Organic Chemistry Lab I	2	
CHE321	Quantitative Analysis	4	
CHE340	Foundations of Physical Chemistry	4	
CHE370	Biochemistry	4	
CHE470	Biochemistry II	3	
PHY110	College Physics I	4	
PHY111	College Physics II	4	
MAT167	Calculus w/ Analytic Geometry I	5	
	TOTAL	63	

ELECTIVES (Complete a minimum of twelve (12) credits from Biology and/or Chemistry courses numbered 300 or higher:			
	TOTAL	12	

Course name change to CHE340 that will allow it to also serve the BS Chemistry student population. Content will remain focused on the foundational concepts required by students earning this degree and working in associated fields.

Remove CHE495 Chemistry Seminar as a requirement.

Removal of University Physics (PHY210/211) options in response to proposed deletion of those courses.

Removal of MAT165/166 sequence as the Calculus option in response to proposed deletion of those courses.

Degree major requirements reduced from 77-81 to 75 credit hours.

Students seeking American Chemical Society certification of their degree must complete chemistry coursework as described below. The courses count toward their degree and free electives.

2021-2022 PROPOSED CURRICULUM – ACS CERTIFICATION OPTION

Degree/Program:	B.S. – Biochemistry & Molecular Biology
Major:	Biochemistry & Molecular Biology
Concentration:	ACS Certification

MAJOR REQUIREMENTS		(82 Credits)	
		Credit	Grade
BIO105	Principles of Organismal Biology	4	
BIO106	Principles of Cell Biology	4	
BIO205	Genetics	4	
BIO225	Ecology	4	
BIO310 BIO430	Molecular Cell Biology Molecular Basis of Disease	OR 4	
CHE111	General Chemistry I	5	
CHE120	General Chemistry II w/ Qual Analy	5	
CHE310	Organic Chemistry I	3	
CHE311	Organic Chemistry Lab I	2	
CHE321	Quantitative Analysis	4	
CHE340	Foundations of Physical Chemistry	4	
CHE370	Biochemistry I	4	
CHE470	Biochemistry II	3	
PHY110	College Physics I	4	
PHY111	College Physics II	4	
MAT167	Calculus w/ Analytic Geom I	5	
	TOTAL	63	

CHEM 340 (4) replaces CHEM 383 (3) & 384 (2)

CHE495 removed as a degree requirement (2)

PHY110 (4) replaces PHY210 (5)

PHY111 (4) replaces PHY211 (5)

ACS (American Chemical Society) Certification courses:			
CHE312/313	Organic Chemistry II/Lab	5	
CHE326	Instrumental Analysis	4	
CHE441	Advanced Inorganic Chemistry	3	
CHE480	Advanced Physical Chemistry	4	
MAT177 MAT287	Calculus w/Analytic Geom II OR Multivariate Calculus	3	
	TOTAL	19	

CHE426 (5) removed as a degree option

CHE480 (4) replaces CHE 381 (3) & CHE 382 (1)

MAT177 and MAT287 each reduced to 3 hours. Option to take either course to satisfy 2nd semester of calculus requirement

Degree option requirements reduced from 87-89 to 82 credit hours.