

# CHEMISTRY, BACHELOR OF SCIENCE (B.S.)

## Program Requirements

CIP Code: 40.0501

### Major

Code	Title	Hours
<b>University Graduation Requirements</b>		
General Education ( <a href="http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/">http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/</a> )		36
<i>Foundations of Learning</i>		
GSD 101	Foundations of Learning	3
Upper division courses (42 hrs. distributed throughout Major/Supporting/Gen Ed/Free Electives categories)		
<b>Major Requirements</b>		
<i>Core Courses</i>		
CHE 111 & 111L	General Chemistry and General Chemistry Lab I	4
CHE 112 & 112L	General Chemistry II and General Chemistry Lab	4
CHE 250 & 250L	Descriptive Inorganic Chemistry and Descriptive Inorganic Chemistry Lab	4
CHE 325 & 325L	Analytical Chemistry and Analytical Chemistry Lab	5
CHE 361 & 361L	Organic Chemistry I and Organic Chemistry Lab I	4
CHE 362 & 362L	Organic Chemistry II and Organic Chemistry Lab II	4
CHE 385	Chemical Literature	3
CHE 430	Biochemistry of Macromolecules	3
CHE 432	Biochemistry Laboratory	1
CHE 471 & 471L	Principles of Physical Chemistry I and Principles of Physical Chemistry I Lab	4
CHE 485	Chemistry Seminar	1
MAT 234	Calculus I <sup>2</sup>	4
<b>Concentrations</b>		
Students must select one of the following Concentrations:		24-44
Biochemistry		
Biochemistry (ACS Certification Optional)		
Pre-Health (Pre-Medical, Pre-Dental, Pre-Optometry, Pre-Physician Associate)		
Chemistry		
Chemistry (ACS Certification Optional)		
Pre-Pharmacy		
Chemistry Teaching		
<i>Free Electives</i>		
Choose from 0-16 hours of free electives		0-16
<b>Total Hours</b>		<b>120-124</b>

### Biochemistry (ACS Certification Optional) Concentration

This program option produces a degree which follows the recommendation from the American Society for Biochemistry and Molecular Biology (ASBMB).

Code	Title	Hours
<b>Concentration Courses</b>		
CHE 402	Polymers and Particles	1
CHE 425 & 425L	Instrumental Analysis and Instrumental Analysis Lab	4
CHE 431	Metabolic Biochemistry	3
CHE 450	Inorganic Chemistry	3
<i>Supporting Course Requirements</i>		
BIO 112 & 112L	Ecology and Evolution and Ecology and Evolution Lab (Element 4) <sup>G</sup>	4
BIO 315 or BIO 320	Genetics Principles of Microbiology	4
BIO 331	Cell Biology	3
MAT 244	Calculus II	4
PHY 131 or PHY 201	College Physics I (Element 4) <sup>G,3</sup> University Physics I	5
PHY 132 or PHY 202	College Physics II <sup>3</sup> University Physics II	5
<b>Total Hours</b>		<b>30</b>

### Biochemistry (ASBMB Certification) Concentration

This program option produces a degree which follows the recommendation from the American Society for Biochemistry and Molecular Biology (ASBMB).

Code	Title	Hours
<b>Concentration Courses</b>		
CHE 425 & 425L	Instrumental Analysis and Instrumental Analysis Lab	4
CHE 431	Metabolic Biochemistry	3
Choose from one hour of the following:		1
CHE 411	Practicum	
CHE 495A	Independent Chemical Research <sup>1</sup>	
CHE 495B	Chemistry Laboratory Independent Research: ____ <sup>1</sup>	
CHE 401L	Chemtopics Lab: _____	
Choose from four hours of either 400- or 500-level CHE or FOR or BIO electives or 300-level or higher FMT electives.		4
<i>Supporting Course Requirements</i>		
BIO 111 & 111L	Cell and Molecular Biology and Cell and Molecular Biology Lab (Element 4) <sup>G</sup>	4
BIO 112 & 112L	Ecology and Evolution and Ecology and Evolution Lab	4
BIO 315 or BIO 320	Genetics Principles of Microbiology	4
BIO 331	Cell Biology	3
STA 215	Introduction to Statistical Reasoning (Element 2) <sup>G</sup>	3
PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I	5
PHY 132	College Physics II	5

or PHY 202 University Physics II

**Total Hours** **31****Chemistry (ACS Certification) Concentration**

Code	Title	Hours
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**Concentration Courses**

CHE 402	Polymers and Particles	1
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Choose from 3 of the 4 Advanced Chemistry courses selected from 11-12 the following:

CHE 425 & 425L	Instrumental Analysis and Instrumental Analysis Lab	
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CHE 431	Metabolic Biochemistry	
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CHE 450 & 450L	Inorganic Chemistry and Inorganic Chemistry Lab	
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CHE 472	Principles of Physical Chemistry II	
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**Supporting Course Requirements**

CSC 174	Introduction to Programming for Science & Engineering	3
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PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I	5
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PHY 132 or PHY 202	College Physics II University Physics II	5
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MAT 244	Calculus II	4
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**Total Hours** **26-27****Chemistry Concentration**

Code	Title	Hours
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**Concentration Courses**

CHE 425 & 425L	Instrumental Analysis and Instrumental Analysis Lab	4
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CHE 450	Inorganic Chemistry	3
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Choose from one hour of the following:

CHE 402	Polymers and Particles	1
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CHE 450L	Inorganic Chemistry Lab	1
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Choose from nine hours of either 400-level CHE or FOR electives or 300-level FMT electives

**Supporting Course Requirements**

PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I	5
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PHY 132 or PHY 202	College Physics II University Physics II	5
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**Total Hours** **24****Chemistry Teaching Concentration**

Following this curriculum and passing the appropriate standardized teacher exams will lead to certification to teach chemistry at the secondary education level. The student must meet the 2.75 GPA requirement listed in the College of Education section under The Office of Teacher Education Services.

Code	Title	Hours
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**Concentration Courses****Supporting Course Requirements**

(Must also complete all Professional Education Requirements)

BIO 111 & 111L	Cell and Molecular Biology and Cell and Molecular Biology Lab (Element 4) <sup>G</sup>
GLY 109	Great Moments in Earth History (Element 4) <sup>G</sup>
PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I

**Professional Education Requirements**

EDC 300	Differentiation in Inclusive Classrooms	3
EDF 203	Educational Foundations	3
EDF 204	Emerging Instructional Technologies	2
EDF 219	Human Development and Learning	3
EDF 413	Assessment in Education	3
EMS 300	Curriculum and Instructional Design	3
EMS 474	Disciplinary Literacy	3
EMS 490	Classroom & Behavior Management	3
ESE 561	Teaching Science in Secondary School	3
SED 104	Special Education Introduction (Element 6) <sup>G</sup>	

**Clinical Experiences:**

CED 100	Clinical I: Introduction to the Education Profession	0.5
CED 200	Clinical II: Understanding the Learner	0.5
CED 300	Clinical III: Curriculum and Instructional Design	0.5
CED 400	Clinical IV: Diagnosis and Prescription	0.5
CED 450	Clinical V: Practicing Teaching	1
CED 499	Clinical VI: The Professional Semester	9

**Exit Requirements****PRAXIS Examination**

Appropriate PRAXIS exams must be completed for each area of certificate on being recommended.

Students must register for and take the PRAXIS exam which correlates to their degree program, per College of Education requirements. Refer to Degree Works for exam details. The PRAXIS exam must be taken prior to student teaching.

**Total Hours** **44****Pre -Health (Pre-Medical, Pre-Dental, Pre-Optometry, Pre-Physician Associate) Concentration**

Code	Title	Hours
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**Concentration Courses**

CHE 402	Polymers and Particles	1
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Choose from twelve hours of either 400 level CHE or FOR electives

**Supporting Course Requirements**

BIO 208 & 208L	Human Anatomy and Physiology I and Human Anatomy & Physio I Lab (Element 4)	4
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BIO 308 & 308L	Human Anatomy and Physiology II and Human Anatomy and Physiology II Lab	4
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BIO 331	Cell Biology	3
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PHI 383	Health & Biomedical Ethics	3
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PSY 200 or SOC 131	Introduction to Psychology (Element 5B) <sup>G</sup> Introductory Sociology
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PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I
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PHY 132 or PHY 202	College Physics II University Physics II
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**Total Hours** **31**

## Pre-Pharmacy Concentration

Code	Title	Hours
<b>Concentration Courses</b>		
Choose from eight hours of the following:		8
CHE 425 & 425L	Instrumental Analysis and Instrumental Analysis Lab	4
CHE 431	Metabolic Biochemistry	3
CHE 450	Inorganic Chemistry	3
CHE 472	Principles of Physical Chemistry II	4
Choose from three hours of the following:		3
CHE 349	Applied Learning in Chemistry	
CHE 349A	Cooperative Study: Chemistry (A-N)	
CHE 495A	Independent Chemical Research	
CHE 495B	Chemistry Laboratory Independent Research: ____	
<i>Supporting Course Requirements</i>		
BIO 208 & 208L	Human Anatomy and Physiology I and Human Anatomy & Physio I Lab (Element 4) <sup>G</sup>	
BIO 273 or BIO 320	Clinical Microbiology Principles of Microbiology	4
BIO 308 & 308L	Human Anatomy and Physiology II and Human Anatomy and Physiology II Lab	4
ECO 230	Fundamentals of Microeconomics	3
PHI 383	Health & Biomedical Ethics	3
PHY 131 or PHY 201	College Physics I (Element 4) <sup>G</sup> University Physics I	
PSY 200	Introduction to Psychology (Element 5B) <sup>G</sup>	
STA 270	Applied Statistics (Element 2) <sup>G</sup>	
<b>Total Hours</b>		<b>29</b>

G Course also satisfies a General Education element. Hours are included within the 36 hr. General Education requirement above.

<sup>1</sup> CHE 495A Independent Chemical Research and/or CHE 495B Chemistry Laboratory Independent Research: \_\_\_\_ (chemistry research) is recommended.

<sup>2</sup> Preparatory courses in mathematics may be required before admission to MAT 122 Precalculus Mathematics or MAT 234 Calculus I.

<sup>3</sup> Calculus based physics (PHY 201 University Physics I and PHY 202 University Physics II) is recommended by the ACS and ASBMB.