# **Biochemistry and Molecular Biology**

Bachelor of Science (BS.BMB)

Core Requir	ements		Credits	Notes/Instructions
College Sem.	Quest for Meaning	CSEM 100	3	†A student may be required to take ENGL
Communication & Creative Expression	Writing Oral Communication Literature The Arts	ENGL 110 <sup>†</sup> COMM 101 ENGL 140-149 ARTS 100-149	3 3 3 3	105 and/or MATH 100 based on placement exams administered prior to their first semester at King's College. ENGL 105 and MATH 100 are 3-credit
Citizenship	History Intercultural Global Connections	HIST 100-149 FREN/GERM/SPAN 100-level or Study Abroad <sup>††</sup> ECON 150-199; GEOG 150-199; HIST 150-199; PS 150-199; SOC 150-199	3 3 3	courses and will count as free electives.  ††The Intercultural Competence
Quantitative & Scientific Reasoning	SBM Quantitative Reasoning SBM Scientific Endeavor SBM Science in Context Human Beh. & Soc. Inst	MATH 120 <sup>†</sup> or higher level NSCI 100 NSCI 171-199 ECON 111, 112; GEOG 101, 102; PS 101, PSYC 101, SOC 101	- - - 3	requirement can be satisfied by taking a 100- level language class for 3 credits or participating in an approved Study Abroad experience. (See
Wisdom, Faith, & the Good Life	Introduction to Phil. Phil. Investigations Theology & Wisdom Theology & the Good Life	PHIL 101 PHIL 170-199 THEO 150-159 THEO 160-169	3 3 3 3	college catalog for more information)  SBM = Satisfied By  Major requirement(s) and credit(s) listed below.
		Total Core Credits	39	

Major Requirements	Credits	Major Requirements	Credits	Electives³/ Other Requirements	Credits
BMB 110L	1	CHEM 113 <sup>2</sup>	3	HCE 101 Holy Cross Exp.	1
BIOL 113 <sup>2</sup>	3	CHEM 113L	1	Free Elective <sup>3</sup>	3
BIOL 113L	1	CHEM 114 <sup>PR</sup>	3	Free Elective <sup>3</sup>	3
BIOL 213 <sup>PR</sup>	3	CHEM 114L <sup>PR</sup>	1	Free Elective <sup>3</sup>	1
BIOL 213L	1	CHEM 241 <sup>PR</sup>	3		
BIOL 353/CHEM 353 <sup>PR,4</sup>	3	CHEM 241LPR	1		
BMB 353L <sup>PR,4</sup>	2	CHEM 242 <sup>PR</sup>	3		
BIOL 450	3	CHEM 242LPR	1		
BIOL 450L	1	CHEM 243 <sup>PR</sup>	3		
BMB Elective*	3	CHEM 243LPR	2		
BMB Elective*	3	CHEM 244 <sup>PR</sup>	3		
BMB Elective*	3	CHEM 244LPR	2		
BMB 455 <sup>6</sup>	1	CHEM351	1		
BMB 456 <sup>6</sup>	1	MATH 129 <sup>2</sup>	4		
BMB Associated Lab	1	MATH 130 <sup>PR</sup>	4		
	_	PHYS 113 <sup>CR</sup>	3		
		PHYS 113L	1		
	_	PHYS 114 <sup>PR</sup>	3		
	_	PHYS 114L <sup>PR</sup>	1		
Total Major Credits	30	Total Major Credits	43	Total Elective / Other Credits	8

#### **Total Credits Required for Graduation = 120**

\*In addition to the Major Sequence requirements, a BMB Major must also complete a minimum of three (3) upper-level courses from the following list. One of these upper-level courses must be research intensive (consult with Biochemistry advisor). Upper level CHEM or BIOL courses not on this list may be substituted at the discretion of the Biochemistry advisor. A BMB Major wishing to be eligible for certification by the American Chemical Society (ACS) must complete BIOL336, BIOL336L, CHEM357, CHEM357L, and CHEM471.

	BMB Electives* (B	iochemistry Electives) - must c	:hoose 3:
BIOL 314	Microbiology	BIOL 490/491	Senior Research
BIOL 326	Immunology	CHEM 357	Physical Chemistry I
BIOL 330	Introduction to Bioinformatics	CHEM 471	Advanced Inorganic Chemistry
BIOL 336	Cell Biology	CHEM 473	Organic Chemistry of Drug Design and Discovery
BIOL 456	Molecular Mech Brain Disorder	CHEM 475	Advanced Analytical Chemistry
		CHEM 496/497	Senior Research

### **General Information:**

A student must earn a minimum of 120 credit hours to be awarded the baccalaureate degree. The number of credit hours required for graduation may be higher in certain major programs <u>or</u> if the student elects to pursue a second major. Beyond the requirements of the Core Curriculum and of a student's chosen major program, the balances of the credit hours required for graduation are "free electives."

## **Biochemistry and Molecular Biology**

## **Suggested Sequence**

A suggested course sequence of degree requirements is listed below. Refer to the college catalog for course titles, descriptions, and prerequisites. Always consult your Academic Advisor when planning and scheduling your classes.

Fall Credits Spring Credits Credits Spring Credits CHEM 241 <sup>PR</sup> Organic Chemistry I 3 CHEM 241 <sup>PR</sup> Organic Chemistry I Lab 1 CHEM 242 <sup>PR</sup> Organic Chemistry I Lab 1 CHEM 242 <sup>PR</sup> Organic Chemistry II Lab 1 CHEM 243 <sup>PR</sup> Analytical Chemistry 3 CHEM 243 <sup>PR</sup> Analytical Chemistry Lab 2 CHEM 244 <sup>PR</sup> Instrumental Analysis 3 CHEM 243 <sup>PR</sup> Analytical Chemistry Lab 2 CHEM 244 <sup>PR</sup> Instrumental Analysis Lab 2 BIOL 213 <sup>PR</sup> Cell & Molecular Biology 3 Core Course <sup>1</sup> 3 Core Cours	Fall	Credits	Spring	Credits
CHEM 1134 General Chemistry   1	BIOL 113 <sup>2</sup> Evolution & Diversity	3	BMB 110L Intro to Biochemical Techniques	1
CHEM 133 General Chemistry   Lab	BIOL 113L Evolution & Diversity Lab	1	CHEM 114PR General Chemistry II	3
MATH 129* Analytic Geometry & Calculus   4	CHEM 113 <sup>2</sup> General Chemistry I	3	CHEM 114L General Chemistry II Lab	1
Core Course¹ 3 Core Course¹ 3 Core Course¹ 3 Core Course¹ 3 Core Course¹ 5 Credits 5 Credits 5 Credits 5 Credits 5 Credits 5 Credits 6 Credits 6 Credits 6 Credits 6 Credits 7 Credits 8 C	CHEM 113L General Chemistry I Lab	1	MATH 130 <sup>2</sup> Analytic Geometry & Calculus II	4
HCE 101 Holy Cross Experience 16 15  Summer Credits  Fall Credits Spring Cremistry   3 CHEM 242 <sup>TR</sup> Organic Chemistry   1 3 CHEM 243 <sup>TR</sup> Analytical Chemistry Lab 2 CHEM 244 <sup>TR</sup> Instrumental Analysis Lab 2 COHEM 243 <sup>TR</sup> Cell & Molecular Biology 3 Core Course <sup>1</sup> 1 Core Course <sup>1</sup> 15 Core Course <sup>1</sup> 15 Core Course <sup>1</sup> 15 Core Course <sup>1</sup> 16 Divide Credits Spring Credits Physics for Scientists & Engineers   1 3 PHYS 113 <sup>TR</sup> Physics for Scientists & Engineers   1 3 PHYS 113 <sup>TR</sup> Physics for Scientists & Engineers   1 3 PHYS 113 <sup>TR</sup> Physics for Scientists & Engineers   1 3 BIOL 450 Molecular Genetics ab 1 PHYS 114 <sup>TR</sup> Physics for Scientists & Engineers   1 3 BIOL 450 Molecular Genetics ab 1 BMB 353 Ladvance Biochemical Techniques 2 CHEM 351 <sup>TR</sup> Technological Competency 1 Core Course <sup>1</sup> 3 BMB Elective* 3 Core Course <sup>1</sup> 3 Core Course <sup>1</sup> 3 Core Course <sup>1</sup> 3 Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 3 Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 17 Free Elective <sup>3</sup> 17 Core Course <sup>1</sup> 17 Core Course <sup>1</sup> 3 Core Course <sup>1</sup> 3 Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 17 Core Course <sup>1</sup> 17 Core Course <sup>1</sup> 18 Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 17 Core Course <sup>1</sup> 17 Core Course <sup>1</sup> 18 Core Course <sup>1</sup> 18 Core Course <sup>1</sup> 19 Core	MATH 129 <sup>2</sup> Analytic Geometry & Calculus I	4	Core Course <sup>1</sup>	3
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Core Course <sup>1</sup>   3	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics	3 1 3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> , Biochemistry	3 1 3
15         15           Summer         Credits           Fall         Credits         Spring         Cred           BMB 455 <sup>4</sup> Senior Colloquium         1         BMB 456 Senior Colloquium         1           BMB Elective*         3         BMB Elective*         3           BMB Elective*         3         Core Course¹         3           BMB Elective Associated Lab*         1         Free Elective³         3           Core Course¹         3         Free Elective³         3           Core Course¹         3         Free Elective³         3           Core Course¹         3         Free Elective³         1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab	3 1 3 1	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> , Biochemistry BMB 353L Advance Biochemical Techniques	3 1 3 2
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BMB 455 <sup>4</sup> Senior Colloquium         1         BMB 456 Senior Colloquium         1           BMB Elective*         3         BMB Elective*         3           BMB Elective Associated Lab*         1         Free Elective <sup>3</sup> 3           Core Course <sup>1</sup> 3         Free Elective <sup>3</sup> 3           Core Course <sup>1</sup> 3         Free Elective <sup>3</sup> 3           Core Course <sup>1</sup> 3         Free Elective <sup>3</sup> 1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup>	3 1 3 1 1 3 3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> , Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup>	3 1 3 2 3
BMB Elective*       3       BMB Elective*       3         BMB Elective*       3       Core Course¹       3         BMB Elective Associated Lab*       1       Free Elective³       3         Core Course¹       3       Free Elective³       3         Core Course¹       3       Free Elective³       1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup>	3 1 3 1 1 3 3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> , Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup>	3 1 3 2 3 3
BMB Elective*       3       BMB Elective*       3         BMB Elective*       3       Core Course¹       3         BMB Elective Associated Lab*       1       Free Elective³       3         Core Course¹       3       Free Elective³       3         Core Course¹       3       Free Elective³       1         Tree Elective³       1       1       Elective³       1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup> Summer	3 1 3 1 1 3 3 3 15 Credits	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> . Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup> Core Course <sup>1</sup>	3 1 3 2 3 3 3
BMB Elective Associated Lab* 1 Free Elective <sup>3</sup> 3  Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 3  Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup> Summer	3 1 3 1 1 3 3 3 T5 Credits	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> . Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup> Core Course <sup>1</sup> Spring	3 1 3 2 3 3 3
Core Course¹         3         Free Elective³         3           Core Course¹         3         Free Elective³         1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup> Summer Fall BMB 455 <sup>4</sup> Senior Colloquium	3 1 3 1 1 1 3 3 3 15 Credits	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> . Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup> Core Course <sup>1</sup> Spring BMB 456 Senior Colloquium	3 1 3 2 3 3 3
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Core Course <sup>1</sup> 3 Free Elective <sup>3</sup> 1	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup> Summer  Fall BMB 455 <sup>4</sup> Senior Colloquium BMB Elective* BMB Elective*	3 1 3 1 1 3 3 3 15 Credits  1 3 3 3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> . Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup> Core Course <sup>1</sup> Spring BMB 456 Senior Colloquium BMB Elective* Core Course <sup>1</sup>	3 1 3 2 3 3 3 <b>15</b> <b>Credi</b> 1 3 3
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	PHYS 113L Physics for Scientists and Engineers I Lab BIOL 450 Molecular Genetics BIOL 450L Molecular Genetics Lab CHEM 351 <sup>PR</sup> Technological Competency Core Course <sup>1</sup> Core Course <sup>1</sup> Summer  Fall BMB 455 <sup>4</sup> Senior Colloquium BMB Elective* BMB Elective* BMB Elective Associated Lab* Core Course <sup>1</sup>	3 1 3 1 1 3 3 1 5 Credits  Credits  1 3 3 1 3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II PHYS 114L <sup>PR</sup> Physics for Scientists & Engineers II Lab BIOL 353/CHEM 353 <sup>PR</sup> . Biochemistry BMB 353L Advance Biochemical Techniques Core Course <sup>1</sup> Core Course <sup>1</sup> Spring BMB 456 Senior Colloquium BMB Elective* Core Course <sup>1</sup> Free Elective <sup>3</sup> Free Elective <sup>3</sup>	3 1 3 2 3 3 3 15 Credi 1 3 3 3 3

#### **NOTES**

<sup>\*\*</sup>The standard semester course load is five courses consisting of 15 – 17 credits. A student may take 18 credits if the science lab puts them over 17 credits (for more information about credit loads, please see the college catalog).

 $<sup>^{1}\</sup>mbox{Choose}$  one course from each of the Core Requirements listed on the reverse side.

<sup>&</sup>lt;sup>2</sup> Course may satisfy both a Major and a Core requirement. BIOL 113 and CHEM 113 satisfy the Scientific Endeavor and Science in Context Core requirement. MATH 129 will satisfy the Quantitative Reasoning Core requirement.

<sup>&</sup>lt;sup>3</sup> Students may select "free electives" for personal enrichment <u>OR</u> for Minor and/or Second Major Requirements.

<sup>&</sup>lt;sup>4</sup> Senior Integrated Assessment (Fall and Spring Semester of Senior Year)

PR Course has a prerequisite – check college catalog.

<sup>&</sup>lt;sup>CR</sup> Course has a corequisite – check college catalog.