DEPARTMENT OF SCIENCE AND MATH

David O'Dell, Department Chair

Professors: Wenwen Du, Ph.D., David O'Dell, Ph.D.
Associate Professors: Anne Coyle, Ph.D., Minfeng Li, Ph.D., Pai Song, Ph.D.
Assistant Professors: Rajan Adhikari, Ph.D., Ethan Backus, Ph.D., Shemail Fatima, Ph.D., Isaac Johnson, Ph.D., Ashley Kooken, Ph.D., Shalika Silva, Ph.D.

The Department of Science and Mathematics prepares students for a variety of careers in the natural sciences, and also serves to prepare students for graduate and professional schools. The BAED programs result in certifications to teach biology and chemistry at the secondary level, while math and general science certifications can be at the middle school level or combined middle school and secondary levels.

Students interested in medicine, pharmacy, dentistry, or veterinary school tend to major in biology and/or chemistry. Some students who are interested in the non-clinical side of medicine pursue graduate degrees in biomedical sciences. Other graduates are employed in a variety of positions involving laboratory data collection and analysis.

Science and Math students can participate in a variety of student organizations including Chi Beta Phi National Scientific Honorary. Students have worked on community service events, helped host national meetings of Chi Beta Phi, and made presentations at the statewide meetings of West Virginia Academy of Sciences. A wide variety of extra-curricular activities also are available for student participation.

For additional information about the Department of Science and Mathematics, its programs, faculty, and organizations call (304) 462-6317.

Degree Programs:

Bachelor of Arts:
- Chemistry
- Mathematics

Bachelor of Science:
- Biology

Bachelor of Arts in Education with majors in:
- Biology (9-Adult)
- Chemistry (9-Adult)
- General Science (5-Adult) or General Science (5-9)
- Mathematics (5-Adult) or Mathematics (5-9)

Minors:
- Biology
- Chemistry
- Mathematics

Glenville State University has partnered with Marshall University Graduate Schools for a 3 + 4 Doctoral Degree in Pharmacology (PharmD) and with the West Virginia School of Osteopathic Medicine for streamlined admission into their medical school. More information is listed in the Graduate Program Partnership section of the catalog.

PRE-PROFESSIONAL PROGRAMS AND HEALTH-RELATED PROFESSIONS

Many health-related professions require degrees from professional schools after completing an undergraduate degree. These professional schools have specific admission requirements and students interested in obtaining one of these degrees should begin planning their undergraduate curriculum as early as possible. Any student interested in pursuing a career in one of these areas should contact the health-professions advisor. Students may choose to declare BS Biology or BA Chemistry as their degree program and should work closely with their academic advisor to determine which degree program will be better suited to their pre-professional goals.

I. Curriculum for Medical, Dental, and Veterinary Professions

A science degree is recommended for students planning careers in medicine, dentistry, or veterinary medicine. It is possible to gain admittance into any of these programs with a non-science major, but it is usually more difficult as a student will be taking the science requirements necessary for admittance into these programs in addition to other requirements for the major. The basic science requirements for admission into medical, dental, or veterinary medical programs are similar. In addition to coursework, most programs require experience in the profession. Some programs have a specific number of hours and types of experience that an applicant must have, thus early planning is critical.

All programs require the applicant take an entrance examination that will test the applicant's knowledge of various fields of science. The minimum entrance requirements for the programs should be completed before taking these exams. Students applying to medical school must take the Medical University Admission Test (MCAT), which is given January-September. The Dental Admission Test (DAT) is required for students applying to dental school; this exam is given year-round. Students applying to veterinary school must take either the General Record Examination (GRE) or the MCAT, depending on the requirement of the school; the GRE is offered year-round.

Basic Requirements for Medical School

BIOL 120, 121 Principles of Biology I and II ..... 8 hours
CHEM 101, 102 General Chemistry I and II ..... 8 hours
CHEM 301, 302 Organic Chemistry I and II ..... 8 hours
CHEM 380 Biochemistry I ..... 4 hours
ENGL 101, 102 Critical Reading and Writing I and II ..... 6 hours
MATH 115 College Algebra ..... 3 hours
PHYS 201, 202 General Physics I and II ..... 8 hours
SOCIAL SCIENCE/BEHAVIOR ..... 3-9 hours
TOTAL ..... 48-54 hours
Some schools may require additional courses in English and Mathematics.

Basic Requirements for Dental and Veterinary School

BIOL 120, 121 Principles of Biology I and II ..... 8 hours
CHEM 101, 102 General Chemistry I and II ..... 8 hours
CHEM 301, 302 Organic Chemistry I and II ..... 8 hours
ENGL 101, 102 Critical Reading and Writing I and II ..... 6 hours
MATH 115 College Algebra ..... 3 hours
PHYS 201, 202 General Physics I and II ..... 8 hours
HISTORY ..... 3-6 hours
TOTAL ..... 44-47 hours
Some schools may require additional courses in English and Mathematics.

Recommended courses for Medical, Dental, and Veterinary School

HLTH 230 and HLTH 231 Anatomy and Physiology I and II ..... 8 hours
BIOL 335 Cell Physiology ..... 4 hours
BIOL 361 Microbiology ..... 4 hours
BIOL 420 Neurobiology ..... 3 hours

BIOL 436 Molecular Genetics ..... 4 hours
CHEM 380 and CHEM 381 Biochemistry I and II ..... 8 hours
MATH 256 Probability and Statistics ..... 3 hours
A student should plan on taking as many of the recommended courses as feasible; it is not necessary to take all of them.

II. Curriculum for Pharmacy

Preparation for a career in pharmacy requires completion of 67-75 credit hours (depending on the program) and an undergraduate degree is not required. Glenville State University has partnered with Marshall University Graduate Schools for a 3 + 4 Doctoral Degree in Pharmacology (PharmD). Information regarding this degree is listed in the Graduate Program Partnership section of the catalog.

General Course Requirements
BIOL 120, 121 Principles of Biology I and II ..... 8 hours
HLTH 230, 231 Anatomy and Physiology I and II * ..... 8 hours
BIOL 361 Microbiology ..... 4 hours
CART 101 Introduction to Public Speaking ..... 3 hours
CHEM 101, 102 General Chemistry I and II ..... 8 hours
CHEM 301, 302 Organic Chemistry I and II ..... 8 hours
ECON 201 Principles of Microeconomics ..... 3 hours
ENGL 101, 102 Critical Reading and Writing I and II ..... 6 hours
HISTORY ..... 3 hours
MATH 115 College Algebra ..... 3 hours
MATH 120 Precalculus ..... 4 hours
MATH 201 Calculus I ..... 4 hours
MATH 256 Probability and Statistics I ..... 3 hours
PHYS 201, 202 General Physics I and II ..... 8 hours
PSYCHOLOGY ..... 3 hours
TOTAL ..... 67-75 hours
** These courses are required by some, but not all programs.*

III. Curriculum for Physician Assistant

Students interested in becoming a Physician Assistant (PA) must complete a Bachelor's Degree. The course requirements for admission into a PA program vary by school, but have some overlap. Physician Assistant programs require that applicants take the GRE.

General Course Requirements
BIOL 120, 121 Principles of Biology I and II ..... 8 hours
HLTH 230, 231 Anatomy and Physiology I and II ..... 8 hours
BIOL 361 Microbiology ..... 4 hours
BIOLOGY (UPPER LEVEL) ..... 4-8 hours
CHEM 101, 102 General Chemistry I and II ..... 8 hours
CHEM 301 Organic Chemistry I ..... 4 hours
CHEM 380 Biochemistry I ..... 4 hours
MATH 256 Probability and Statistics I ..... 3 hours
PHYS 201, 202 General Physics I and II ..... 8 hours
PSYCHOLOGY ..... 3-6 hours
TOTAL ..... 54-61 hours

IV. **Curriculum for Wildlife Biology**

Students interested in a career in wildlife biology will be well-prepared by majoring in biology. Depending on career aspirations in wildlife biology, courses from the Wildlife Management major offered by the Department of Land Resources at the university may also be possible. Students interested in wildlife biology will work with their advisor to create the best plan of study for their career aspirations.

BACHELOR OF SCIENCE
BIOLOGY

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must complete BIOL 120 and MATH 115 as part of the General Education requirements.

Biology Major **71 hours**

BIOL	120	Principles of Biology I	
BIOL	121	Principles of Biology II	4
BIOL	193	Scientific Writing	1
BIOL	236	Introduction to Genetics	4
BIOL	293	Experimental Design	1
BIOL	493	Senior Seminar	1
BIOL	497	Internship II (OR)	
BIOL	499	Individual Research Problems	3
CHEM	101	General Chemistry I	4
CHEM	102	General Chemistry II	4
CHEM	301	Organic Chemistry I	4
MATH	115	College Algebra	
MATH	120	Precalculus (OR)	
MATH	125	College Trigonometry (OR)	
MATH	202	Calculus I	3-4
MATH	256	Probability and Statistics I	3
PHYS	201	General Physics I	4
PHYS	202	General Physics II	4
Restricted Electives			31

Students are required to complete at least one course from each of the following categories:

Organismal Biology (select at least one)

BIOL	305	General Botany	4
BIOL	314	Zoology	4
BIOL	351	Flora of West Virginia	3
BIOL	361	Microbiology	4
*WLMT	404	Mammalogy	4

*WLMT 404 will not count for the one required course in this category.
If a student takes WLMT 404, they must select at least two from this category.

Ecology/Evolution (select at least one)

BIOL	371	Evolution	4
BIOL	400	Ecology and Field Biology	4

Cellular/Physiology (select at least one)

BIOL	321	Animal Physiology	4
BIOL	335	Cell Physiology	4
BIOL	420	Neurobiology	3
BIOL	435	Developmental Biology	4
BIOL	460	Molecular Ecology	4
CHEM	380	Biochemistry I	4
CHEM	381	Biochemistry II	4

Applied Biology (select at least one)

BIOL	425	Bioethics	2
BIOL	436	Molecular Genetics	4
BIOL	470	Conservation Biology	4
BIOL	480	Topics in Biology	2

(continued on next page)

*+HLTH	231	Anatomy & Physiology II	4
+NRMT	201	Forest Ecology	3

*This course has a prerequisite (HLTH 230) that does not count toward the biology major, but will count toward General Electives.
*+If you apply HLTH 231 or NRMT 201 toward the biology major you must take equivalent hours of upper-level electives from the General Electives.

General Electives **19 hours**

General electives should be selected with consultation with your advisor to determine the best electives to help you toward a career and/or professional goal.

Total minimum hours required for degree **120 hours**

GATEWAY ASSESSMENT – BIOL 293

CAPSTONE ASSESSMENT – BIOL 493

Suggested for a Career in:
Ecology and Conservation

BIOL	305	Botany
BIOL	314	Zoology
BIOL	351	Flora of West Virginia
BIOL	371	Evolution
BIOL	400	Ecology and Field Biology
BIOL	460	Physiological Ecology
BIOL	470	Conservation Biology
NRMT	201	Forest Ecology

Pre-Professional (Pre-Med, Pre-Dental, Pre-Physician Assistant, Pre-Veterinarian)

HLTH	230	Anatomy and Physiology I
BIOL	314	Zoology
BIOL	335	Cell Physiology
BIOL	361	Microbiology
BIOL	371	Evolution
BIOL	420	Neurobiology
BIOL	425	Bioethics
BIOL	435	Developmental Biology
CHEM	302	Organic Chemistry II
CHEM	380	Biochemistry I
CHEM	381	Biochemistry II

Wildlife Biology
Required courses: Completion of these courses will allow eligibility to apply for an Associate Certificate in Wildlife Biology from the Wildlife Society.

BIOL	305	Botany
BIOL	314	Zoology
BIOL	351	Flora of West Virginia
BIOL	371	Evolution
BIOL	400	Ecology and Field Biology
BIOL	460	Physiological Ecology
BIOL	470	Conservation Biology
ENVR	393	Environmental Compliance
PSYC	201	General Psychology or

WLMT	301	Wildlife Law and Policy
WLMT	302	Wildlife Habitat Management
WLMT	404	Mammalogy
WLMT	493	Wildlife Techniques

Other Biology Careers – talk to your advisor about the best courses for you.

BS: BIOLOGY
SUGGESTED PLAN OF STUDY

FIRST YEAR

BIOL 120 (OR) BIOL 121	4
BIOL 193	1
CHEM 101	4
ENGL 101	3
GSU 100	0
MATH 115	3
Total Hours - Fall Semester	**15**

ART 200 (OR) MUSC 200	2
BIOL 120 (OR) BIOL 121	4
CART 101 (or other Gen Ed)	3
CHEM 102	4
ENGL 102	3
Total Hours - Spring Semester	**16**

SECOND YEAR

BIOL 293	1
CHEM 301	4
HIST 201, 202, 207, 208 (OR) POSC 203	3
MATH 120 (OR) 125 (OR) MATH 202	3-4
BIOLOGY ELECTIVE	4
Total Hours - Fall Semester	**15-16**

BIOL 236 (OR) BIOLOGY ELECTIVE	4
ECON 201, 202, GEOG 203, PSYC 201, (OR) SOCS 225	3
MATH 256	3
BIOLOGY ELECTIVE	4
Total Hours - Spring Semester	**14**

THIRD YEAR

HIST 201, 202, 207, 208 (OR) POSC 203	3
PHYS 201	4
BIOLOGY ELECTIVE	4
GENERAL ELECTIVE	4
Total Hours - Fall Semester	**15**

BIOL 236 (OR) BIOLOGY ELECTIVE	4
BIOL 497 (OR) 499	1
PHYS 202	4
BIOLOGY ELECTIVE	3
GENERAL ELECTIVE	3
Total Hours - Spring Semester	**15**

FOURTH YEAR

BIOL 497 (OR) 499	1
ENGL 203, 204, 205, (OR) 206	3
GENERAL ELECTIVE	3
BIOLOGY ELECTIVES	8
Total Hours - Fall Semester	**15**

BIOL 236 (OR) BIOLOGY ELECTIVE	4
BIOL 493	1
BIOL 497 (OR) 499	1
GENERAL ELECTIVES	9
Total Hours - Spring Semester	**15**

BACHELOR OF ARTS
CHEMISTRY

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must complete CHEM 101, and MATH 115 as part of the General Education requirements.

Chemistry Major Requirement **49 hours**

BIOL	120	Principles of Biology I	4
CHEM	101	General Chemistry I	
CHEM	102	General Chemistry II	4
CHEM	293	Techniques of Chemistry	1
CHEM	301	Organic Chemistry I	4
CHEM	302	Organic Chemistry II	4
CHEM	307	Inorganic Chemistry (OR)	
CHEM	380	Biochemistry I	4
CHEM	321	Analytical Chemistry I	4
CHEM	493	Senior Research Seminar	2
MATH	120	Precalculus	4
MATH	256	Probability and Statistics I	3
PHYS	201	General Physics I	4
PHYS	202	General Physics II	4
CHEM Electives (select from the following)			7

CHEM	307	Inorganic Chemistry	4
CHEM	322	Analytical Chemistry	4
CHEM	341	Nuclear Chemistry	4
CHEM	345	Introductory Physical Chemistry	3
CHEM	380	Biochemistry I	4
CHEM	381	Biochemistry II	4

Minor (hours will vary depending on minor selection) **20 hours**

General Electives (hours will vary depending on minor selection) **21 hours**
Recommended courses for graduate school in chemistry:

CHEM	322	Analytical Chemistry II	4
CHEM	345	Introductory Physical Chemistry*	3
MATH	202	Calculus I	4
MATH	207	Calculus II	4
PHYS	350	Modern Physics	3

Total minimum hours required for degree **120 hours**

GATEWAY ASSESSMENT - CHEM 293

CAPSTONE ASSESSMENT - CHEM 493

**If introductory physical chemistry is taken as one of the chemistry electives then additional hours in math courses are required as prerequisites. Introductory physical chemistry (CHEM 345) requires 4 additional hours of math (MATH 202).*

Students enrolled in chemistry courses are responsible for all lost or broken glassware and equipment. At the beginning of the semester, the student will verify that all laboratory items assigned to him/her are present and in good condition. At the end of the semester, the student must return all items in the same condition. If any items were lost or broken throughout the semester, the student will receive a financial statement either during the last

week of classes or during the final examination period. This financial obligation must be paid to the Cashier's Office before the student can graduate. Students who fail to check out of the laboratory will be charged an additional fee.

BA: CHEMISTRY
SUGGESTED PLAN OF STUDY

FIRST YEAR

CART 101	3
CHEM 101	4
ENGL 101	3
GSU 100	0
HIST 201, 202, 207, 208 (OR) POSC 203	3
MATH 115	3
Total Hours - Fall Semester	**16**

BIOL 120	4
CHEM 102	4
ENGL 102	3
MATH 256	3
Total Hours - Spring Semester	**14**

SECOND YEAR

CHEM 293	1
CHEM 301	4
ENGL 203, 204, 205 (OR) 206	3
MATH 120	4
PHYS 201	4
Total Hours - Fall Semester	**16**

CHEM 302	4
PHYS 202	4
MINOR/GENERAL ELECTIVES	6
Total Hours - Spring Semester	**14**

THIRD YEAR

CHEM 307 (OR) CHEM 380 (OR) CHEM 321	4
HIST 201, 202, 207, 208 (OR) POSC 203	3
MINOR/GENERAL ELECTIVES	8
Total Hours - Fall Semester	**15**

ART 200 (OR) MUSC 200	2
ECON 201, 202, GEOG 203, PSYC 201, (OR) SOCS 225	3
CHEMISTRY ELECTIVES	4
MINOR/GENERAL ELECTIVES	6
Total Hours - Spring Semester	**15**

FOURTH YEAR

CHEM 321 (OR) CHEM 307 (OR) CHEM 380	4
CHEM 493	2
MINOR/GENERAL ELECTIVES	9
Total Hours - Fall Semester	**15**

CHEMISTRY ELECTIVE	3
MINOR/ELECTIVES	12
Total Hours - Spring Semester	**15**

BACHELOR OF ARTS
EDUCATION
BIOLOGY (9-Adult)

Candidates may wish to combine this specialization with another (5-9), (9-Adult), (5-Adult) or (PreK-Adult) specialization.

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must complete CART 101, CHEM 101, and MATH 115 as part of the General Education requirements.

Content Specialization Courses **46 hours**

Total Hours in Biology				**35 hours**
BIOL	120	Principles of Biology I	4	
BIOL	121	Principles of Biology II	4	
BIOL	193	Scientific Writing	1	
BIOL	293	Experimental Design	1	
BIOL	305	General Botany	4	
BIOL	314	Zoology	4	
BIOL	335	Cell Physiology	4	
BIOL	371	Evolution	4	
BIOL	400	Ecology and Field Biology	4	
BIOL	236	Introduction to Genetics	4	
BIOL	493	Senior Seminar	1	
Total Hours in Chemistry				**4 hours**
CHEM	101	General Chemistry I		
CHEM	102	General Chemistry II	4	
Total Hours in Mathematics				**3 hours**
MATH	115	College Algebra		
MATH	256	Probability and Statistics I	3	
Total Hours in Physics				**4 hours**
PHYS	201	General Physics I	4	

Professional Education				**26 hours**
CART	101	Introduction to Public Speaking		
CSCI	267	Computer Skills for Education		3
EDSP	220	Introduction to Educating Exceptional and Culturally Diverse Students		3
EDSP	334	Strategies for Educating Exceptional and Culturally Diverse Students		3
EDUC	203	Foundations of Education		3
EDUC	205	Educational Psychology*		3
EDUC	310	Classroom Management and Teaching Strategies		3
EDUC	345	Teaching Science in Middle and Adolescent Education (5-Adult)		2
EDUC	412	Curriculum and Assessment: Content (5-Adult)		2

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PED	201	First Aid and Safety	1
READ	317	Teaching Reading in Middle and Adolescent Education	3

Student Internship **18 hours**

EDUC	470	Residency	6
EDUC	480	Residency II	11
EDUC	493	Capstone Assessment	1

Total minimum hours required for degree **120 hours**

In order to be officially and fully admitted to Teacher Education, ALL teacher candidates must meet and pass all sections of PRAXIS I (CORE) – Reading, Writing, and Math OR meet the WVDE approved exemptions for CORE. It is critical that teacher candidates check their Degree Works audit and speak with their academic advisors to see if they meet CORE exemptions.

GATEWAY ASSESSMENT – ADMISSION TO TEACHER EDUCATION

CAPSTONE ASSESSMENT – EDUCATION 493

BA: EDUCATION
BIOLOGY (9-Adult)
SUGGESTED PLAN OF STUDY

FIRST YEAR

BIOL 120 (OR) BIOL 121	4	BIOL 121 (OR) BIOL 120	4
CSCI 267	3	BIOL 193	1
EDUC 203	3	CART 101	3
ENGL 101	3	EDUC 205	3
GSU 100	0	ENGL 102	3
MATH 115	3	MATH 256	3
Total Hours - Fall Semester	**16**	**Total Hours - Spring Semester**	**17**

SECOND YEAR

BIOL 314 (OR) BIOL 400	4	ART 200 (OR) MUSC 200	2
BIOL 293	1	BIOL 305 AND/OR BIOL 335 AND/OR BIOL 371	8
CHEM 101	4	CHEM 102	4
EDSP 220	3	PED 201	1
HIST 201, 202, 207, 208 (OR) POSC 203	3		
Total Hours - Fall Semester	**15**	**Total Hours - Spring Semester**	**15**

THIRD YEAR

BIOL 400 (OR) BIOL 314	4	BIOL 305 AND/OR BIOL 335 AND/OR BIOL 371	4
ECON 201, 202, GEOG 203, PSYC 201, (OR) SOCS 225	3	BIOL 236	4
EDUC 310	3	BIOL 493	1
HIST 201, 202, 207, 208 (OR) POSC 203	3	EDUC 345	2
PHYS 201	4	EDUC 412	2
		ENGL 203, 204, 205 (OR) 206	3
Total Hours - Fall Semester	**17**	**Total Hours - Spring Semester**	**16**

Attempt PRAXIS II Exam(s) prior to Residency I.

FOURTH YEAR

EDSP 334	3	EDUC 480	11
EDUC 470	6	EDUC 493	1
READ 317	3	**Total Hours - Spring Semester**	**12**
Total Hours - Fall Semester	**12**		

RESIDENTS MAY NOT ENROLL IN ANY OTHER COURSES (except EDUC 493) WHILE IN RESIDENCY II. PRAXIS II exam(s) must be passed before entering Residency II.

BACHELOR OF ARTS
EDUCATION
CHEMISTRY (9-Adult)

Candidates may wish to combine this specialization with another (5-9), (9-Adult), (5-Adult) or (PreK-Adult) specialization.

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must complete CART 101, CHEM 101 and MATH 202* as part of the General Education requirements.

*MATH 115 and MATH 120 or 125 may be required as a prerequisite for MATH 202 if candidates do not have a MATH ACT of 24 or SAT of 610 or higher.

Content Specialization Courses **46 hours**

Total Hours in Biology				**8**
BIOL	120	Principles of Biology I	4	
BIOL	121	Principles of Biology II	4	
Total Hours in Chemistry				**27**
CHEM	101	General Chemistry I		
CHEM	102	General Chemistry II	4	
CHEM	293	Techniques of Chemistry	1	
CHEM	301	Organic Chemistry I	4	
CHEM	302	Organic Chemistry II	4	
CHEM	307	Inorganic Chemistry	4	
CHEM	321	Analytical Chemistry I	4	
CHEM	380	Biochemistry I	4	
CHEM	493	Senior Research Seminar	2	
Total Hours in Physics				**11**
PHYS	201	General Physics I	4	
PHYS	202	General Physics II	4	
PHYS	345	Introductory Chemical Physics	3	

Professional Education **26 hours**

CART	101	Introduction to Public Speaking	
CSCI	267	Computer Skills for Education	3
EDSP	220	Introduction to Educating Exceptional and Culturally Diverse Students	3
EDSP	334	Strategies for Educating Exceptional and Culturally Diverse Students	3
EDUC	203	Foundations of Education	3
EDUC	205	Educational Psychology*	3
EDUC	310	Classroom Management and Teaching Strategies	3
EDUC	345	Teaching Science in Middle and Adolescent Education (5-Adult)	2
EDUC	412	Curriculum and Assessment: Content (5-Adult)	2
PED	201	First Aid and Safety	1
READ	317	Teaching Reading in Middle and Adolescent Education	3

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Residency				**18 hours**
EDUC	470	Residency I	6	
EDUC	480	Residency II	11	
EDUC	493	Capstone Assessment	1	

Total minimum hours required for degree **120 hours**

In order to be officially and fully admitted to Teacher Education, ALL teacher candidates must meet and pass all sections of PRAXIS I (CORE) – Reading, Writing, and Math OR meet the WVDE approved exemptions for CORE. It is critical that teacher candidates check their Degree Works audit and speak with their academic advisors to see if they meet CORE exemptions.

GATEWAY ASSESSMENT – ADMISSION TO TEACHER EDUCATION

CAPSTONE ASSESSMENT – EDUC 493

BA: EDUCATION
CHEMISTRY (9-Adult)
SUGGESTED PLAN OF STUDY

FIRST YEAR

BIOL 120 (OR) BIOL 121	4	BIOL 121 (OR) BIOL 120	4
CHEM 101	4	CART 101	3
CSCI 267	3	CHEM 102	4
EDUC 203	3	EDUC 205	3
ENGL 101	3	ENGL 102	3
GSU 100	0	PED 201	1
Total Hours - Fall Semester	**16**	**Total Hours - Spring Semester**	**18**

SECOND YEAR

CHEM 293	1	ART 200 (OR) MUSC 200	2
CHEM 301	4	CHEM 302	4
CHEM 307 (OR) CHEM 321	4	HIST 201, 202, 207, 208 (OR) POSC 203	3
PHYS 201	4	MATH 202	4
Total Hours - Fall Semester	**13**	PHYS 202	4
		Total Hours - Spring Semester	**17**

THIRD YEAR

CHEM 307 (OR) CHEM 321	4	CHEM/PHYS 345	3
CHEM 380	4	CHEM 493	2
EDSP 220	3	ECON 201, 202, GEOG 203, PSYC 201, (OR) SOCS 225	3
EDUC 310	3	EDUC 412	2
EDUC 345	2	ENGL 203, 204, 205 (OR) 206	3
Total Hours - Fall Semester	**16**	HIST 201, 202, 207, 208 (OR) POSC 203	3
		Total Hours - Spring Semester	**16**

Attempt PRAXIS II Exam(s) prior to Residency I

FOURTH YEAR

EDUC 470	6	EDUC 480*	11
EDSP 334	3	EDUC 493	1
READ 317	3	**Total Hours - Spring Semester**	**12**
Total Hours - Fall Semester	**12**		

***RESIDENTS MAY NOT ENROLL IN ANY OTHER COURSES (except EDUC 493) WHILE IN RESIDENCY II. PRAXIS II exam(s) must be passed before entering Residency II.**

BACHELOR OF ARTS
EDUCATION
GENERAL SCIENCE (5-Adult)

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must take BIOL 120, CART 101, and MATH 115 as part of the General Education requirements.

Content Specialization Courses **43 hours**

Total Hours in Biology					**12 hours**
BIOL	120	Principles of Biology I			
BIOL	121	Principles of Biology II		4	
BIOL	400	Ecology and Field Biology		4	
Restricted Elective (select from the following)				4	
	BIOL	335	Cell Physiology	4	
	BIOL	371	Evolution	4	
	BIOL	236	Introduction to Genetics	4	

Total Hours in Chemistry				**12 hours**
CHEM	101	General Chemistry I	4	
CHEM	102	General Chemistry II	4	
CHEM	301	Organic Chemistry I (OR)		
CHEM	321	Analytical Chemistry I	4	

Total Hours in Mathematics				**3-4 hours**
MATH	115	College Algebra		
MATH	120	Precalculus (OR)		
MATH	256	Probability and Statistics I	4-3	

Total Hours in Physics				**16 hours**
PHYS	201	General Physics I	4	
PHYS	202	General Physics II	4	
PHYS	209	General Geology	4	
PHYS	310	General Astronomy	4	

Professional Education **26 hours**

CART	101	Introduction to Public Speaking	
CSCI	267	Computer Skills for Education	3
EDSP	220	Introduction to Educating Exceptional and Culturally Diverse Students	3
EDSP	334	Strategies for Educating Exceptional and Culturally Diverse Students	3
EDUC	203	Foundations of Education	3
EDUC	205	Educational Psychology*	3
EDUC	310	Classroom Management and Teaching Strategies	3
EDUC	345	Teaching Science in Middle and Adolescent Education (5-Adult)	2
EDUC	412	Curriculum and Assessment: Content (5-Adult)	2
PED	201	First Aid and Safety	1
READ	317	Teaching Reading in Middle and Adolescent Education	3

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Residency				**18 hours**
EDUC	470	Residency I	6	
EDUC	480	Residency II	11	
EDUC	493	Capstone Assessment	1	

General Electives **2-3 hours**

Elective hours are dependent upon content area course completion

Total minimum hours required for degree **120 hours**

In order to be officially and fully admitted to Teacher Education, ALL teacher candidates must meet and pass all sections of PRAXIS I (CORE) – Reading, Writing, and Math OR meet the WVDE approved exemptions for CORE. It is critical that teacher candidates check their Degree Works audit and speak with their academic advisors to see if they meet CORE exemptions.

GATEWAY ASSESSMENT – ADMISSION TO TEACHER EDUCATION

CAPSTONE ASSESSMENT – EDUC 493

BA: EDUCATION
GENERAL SCIENCE (5-Adult)
SUGGESTED PLAN OF STUDY

FIRST YEAR

BIOL 120 (OR) BIOL 121	4
CART 101	3
EDUC 203	3
ENGL 101	3
GSU 100	0
MATH 115	3
Total Hours - Fall Semester	**16**

BIOL 120 (OR) BIOL 121	4
CSCI 267	3
ECON 201, 202, GEOG 203, PSYC 201 (OR) SOCS 225	3
EDUC 205	3
ENGL 102	3
Total Hours - Spring Semester	**16**

SECOND YEAR

CHEM 101	4
ENGL 203, 204, 205 (OR) 206	3
MATH 120 (OR) 256	3-4
PED 201	1
PHYS 201	4
Total Hours - Fall Semester	**15-16**

CHEM 102	4
EDSP 220	3
HIST 201, 202, 207, 208 (OR) POSC 203	3
PHYS 202	4
PHYS 209 (OR) BIOL ELECTIVE	4
Total Hours - Spring Semester	**18**

THIRD YEAR

BIOL 400	4
CHEM 301 (OR) 321	4
EDUC 310	3
HIST 201, 202, 207, 208 (OR) POSC 203	3
PHYS 310	4
Total Hours - Fall Semester	**18**

ART 200 (OR) MUSC 200	2
EDUC 412	2
EDUC 345	3
PHYS 209 (OR) BIOL ELECTIVE	4
GENERAL ELECTIVES	2-3
Total Hours - Spring Semester	**13-14**

Attempt PRAXIS II Exam(s) prior to Residency I.

FOURTH YEAR

EDSP 334	3
EDUC 470	6
READ 317	3
Total Hours - Fall Semester	**12**

EDUC 480*	11
EDUC 493	1
Total Hours - Spring Semester	**12**

***RESIDENTS MAY NOT ENROLL IN ANY OTHER COURSES (except EDUC 493) WHILE IN RESIDENCY II. PRAXIS II exam(s) must be passed before entering Residency II.**

BACHELOR OF ARTS
EDUCATION
MATHEMATICS (5-Adult)

Candidates may wish to combine this specialization with another (5-9), (9-Adult), (5-Adult) or (PreK-Adult) specialization.

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**
Students must take CART 101 and MATH 110 as part of the General Education requirements.

Content Specialization Courses **35 hours**

MATH	110	The Nature of Math	4
MATH	201*	Introduction to Mathematical Reasoning and Proofs	3
MATH	202	Calculus I	4
MATH	207	Calculus II	4
MATH	230	Euclidean Geometry for College Students	3
MATH	256	Probability and Statistics I	3
MATH	265	Mathematical Topics for Teaching	3

Mathematical Restricted Electives (select from the following) 15

MATH	303	Modern Algebra	3
MATH	308	Calculus III	4
MATH	315	Linear Algebra	3
MATH	321	History of Mathematics	3
MATH	330	Discrete Mathematics	3
MATH	356	Probability & Statistics II	3
MATH	408	Differential Equations	3
MATH	421	Introduction to Topology	3
MATH	431	Introduction to Numerical Methods	3

*MATH 115 and MATH 120 or MATH 125 may be required as a prerequisite(s) if candidates do not have an ACT Math score of 26 or above or SAT Math score of 610 or above. Those can be counted as general electives if any is taken.

Professional Education **27 hours**

CART	101	Introduction to Public Speaking	
CSCI	267	Computer Skills for Education	3
EDSP	220	Introduction to Educating Exceptional and Culturally Diverse Students	3
EDSP	334	Strategies for Educating Exceptional and Culturally Diverse Students	3
EDUC	203	Foundations of Education	3
EDUC	205	Educational Psychology	3
EDUC	310	Classroom Management and Teaching Strategies	3
EDUC	343	Teaching Mathematics in Middle and Adolescent Education (5-Adult)	3
EDUC	412	Curriculum and Assessment: Content (5-Adult)	2
PED	201	First Aid and Safety	1
READ	317	Teaching Reading in Middle and Adolescent Education	3

Residency **18 hours**

EDUC	470	Residency I	6
EDUC	480	Residency II	11
EDUC	493	Capstone Assessment	1

(continued on next page)

General Electives	**10 hours**
Total minimum hours required for degree	**120 hours**

In order to be officially and fully admitted to Teacher Education, ALL teacher candidates must meet and pass all sections of PRAXIS I (CORE) – Reading, Writing, and Math OR meet the WVDE approved exemptions for CORE. It is critical that teacher candidates check their Degree Works audit and speak with their academic advisors to see if they meet CORE exemptions.

GATEWAY ASSESSMENT – ADMISSION TO TEACHER EDUCATION

CAPSTONE ASSESSMENT – EDUC 493

BA: EDUCATION
MATHEMATICS (5-Adult)
SUGGESTED PLAN OF STUDY

This plan of study is intended for students with an ACT Math score 24 or above or SAT Math score 590 or above. Other students should consult their advisor for a revised plan of study.

FIRST YEAR

CART 101	3
EDUC 203	3
ENGL 101	3
GSU 100	0
HIST 201, 202, 207, 208 (OR) POSC 203	3
MATH 110 (OR) MATH 256	3
Total Hours - Fall Semester	**15**

CSCI 267	3
EDUC 205	3
MATH 201	3
MATH 202	4
MATH 230	3
PED 201	1
Total Hours - Spring Semester	**17**

SECOND YEAR

EDSP 220	3
ENGL 102	3
MATH 207	4
MATH 110 (OR) MATH 256	3
RESTRICTED ELECTIVE	3
Total Hours - Fall Semester	**16**

ECON 201, ECON 202, GEOG 203, PSYC 201 (OR) SOCS 225	3
ENGL 203, 204, 205 (OR) 206	3
ENVR 101, SCNC 101, 102 (OR) 103	4
GENERAL ELECTIVE	2
RESTRICTED ELECTIVE	3
Total Hours - Spring Semester	**15**

THIRD YEAR

ART 200 (OR) MUSC 200	2
EDUC 310	3
EDUC 343	3
MATH 265	3
GENERAL ELECTIVE	3
RESTRICTED ELECTIVE	3
Total Hours - Fall Semester	**17**

EDUC 412	2
HIST 201, 202, 207, 208 (OR) POSC 203	3
GENERAL ELECTIVES	3
RESTRICTED ELECTIVE	6
Total Hours - Spring Semester	**14**

Attempt PRAXIS II Exam(s) prior to Residency I

FOURTH YEAR

EDSP 334	3
EDUC 470	6
READ 317	3
Total Hours - Fall Semester	**12**

EDUC 480*	11
EDUC 493	1
Total Hours - Spring Semester	**12**

***RESIDENTS MAY NOT ENROLL IN ANY OTHER COURSES (except EDUC 493). PRAXIS II exam(s) must be passed before entering Residency II.**

BACHELOR OF ARTS
EDUCATION
MIDDLE SCHOOL SPECIALIZATIONS

This program may be combined with Elementary Education (K-6) specialization only.

GENERAL SCIENCE (5-9)			**18 hours**
BIOL	121	Principles of Biology II	4
CHEM	205	General. Organic, and Biochemistry	3
CHEM	206	GOB Laboratory	1
SCNC	101	Earth Science	4
SCNC	102	Nature of Sound and Light	4
EDUC	345	Teaching Science in Middle and Adolescent Education	2

This program may be combined with (PreK-adult), (5-adult) or (9-adult) specialization.

GENERAL SCIENCE (5-9)			**34 hours**
BIOL	120	Principles of Biology I	4
BIOL	121	Principles of Biology II	4
CHEM	101	General Chemistry I	4
CHEM	102	General Chemistry II	4
PHYS	201	General Physics I	4
PHYS	202	General Physics II	4
PHYS	209	General Geology	4
PHYS	310	General Astronomy	4
EDUC	345	Teaching Science in Middle and Adolescent Education	2

This program may be combined with (PreK-adult), (5-adult), or (9-adult) specializations.

GENERAL MATH–ALGEBRA I (5-9)			**23 hours**
Candidates must take MATH 115 as part of the General Education requirements.			
MATH	110	The Nature of Math	3
MATH	115	College Algebra	
MATH	120	Precalculus	4
MATH	201	Introduction to Mathematical Reasoning and Proofs	3
MATH	202	Calculus I	4
MATH	230	Euclidean Geometry for College Students	3
MATH	256	Probability and Statistics I	3
EDUC	343	Teaching Mathematics in Middle and Adolescent Education	3

GATEWAY ASSESSMENT – ADMISSION TO TEACHER EDUCATION

CAPSTONE ASSESSMENT – EDUCATION 493

BACHELOR OF ARTS
MATHEMATICS

GSU 100 The First Year Experience **0 hour**
All degree seeking students are required to take GSU 100 during their first semester.

General Education Requirements **30 hours**

Students must take MATH 110 and PHYS 201 as part of the general education requirements.

Mathematics Major **64 hours**

MATH	201*	Introduction to Reasoning and Proof	3
MATH	202*	Calculus I	4
MATH	207	Calculus II	4
MATH	230	Euclidean Geometry for College Students	3
MATH	256	Probability and Statistics	3
MATH	293	Techniques of Mathematics	1
MATH	303	Modern Algebra	3
MATH	308	Calculus III	4
MATH	315	Linear Algebra	3
MATH	321	History of Mathematics	3
MATH	330	Discrete Mathematics	3
MATH	356	Probability and Statistics II	3
MATH	408	Differential Equations	3
MATH	421	Introduction to Topology	3
MATH	431	Intro to Numerical Methods	3
MATH	493	Senior Research Seminar	2

Restricted Electives (select from the following three categories) 16

At least 9 credits from one of the following categories;
At least 3 credits from each of the remaining categories.

Applied Topology

LAND	121*	Introduction to Land Surveying	3
LAND	193**	Survey Math and Geomatics I	3
LAND	230	Survey Math and Geomatics I	3
NRMT	125	Computer Assisted Mapping	3
NRMT	234	GIS Applications I	3
NRMT	334	GIS Applications II	3

Business

ACCT	231	Principles of Accounting I	3
ACCT	232	Principles of Accounting I	3
BUSN	230	Quantitative Business Analysis	3
ECON	201	Principles of Microeconomics	3
ECON	202	Principles of Macroeconomics	3
ECON	420	The Financial System and Economy	3

Science and Engineering

BIOL	371**	Evolution	4
BIOL	400**	Ecology and Field Biology	4
BIOL	470**	Conservation Biology	4
PHYS	202	General Physics II	4

*MATH 115, and MATH 120 or MATH 125 may be required as a prerequisite(s) if candidates do not have an ACT Math score of 26 or above or SAT Math score of 610 or above. Those can be counted as general electives if any is taken.
**BIOL 120 and/or 121, or NRMT 201 may be required as a prerequisite(s). It can be counted as general electives if any is taken.

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General Electives **26 hours**

Total minimum hours required for degree **120 hours**

GATEWAY ASSESSMENT – MATH 293

CAPSTONE ASSESSMENT – MATH 493

If you are interested in medical or bioinformatics, then the following courses are recommended. (See a mathematics and/or biology advisor).

BIOL	120	Principles of Biology I
BIOL	121	Principles of Biology II
BIOL	361	Microbiology
BIOL	371	Evolution
BIOL	400	Ecology and Field Biology
BIOL	470	Conservation Biology

BA: MATHEMATICS
SUGGESTED PLAN OF STUDY

This plan of study is intended for students with an ACT Math score 26 or above or SAT Math score 610 or above. Other students should consult their advisor for a revised plan of study.

FIRST YEAR

ENGL 101	3
GSU 100	0
HIST 201, 202, 207, 208 (OR) POSC 203	3
MATH 110 (OR) CART 101	3
MATH 256	3
MATH (OR) GENERAL ELECTIVE	3
Total Hours - Fall Semester	**15**

ART 200 (OR) MUSC 200	2
MATH 201	3
MATH 202	4
MATH 230	3
MATH (OR) GENERAL ELECTIVE	3
Total Hours - Spring Semester	**15**

SECOND YEAR

CART 101 (OR) MATH 110	3
MATH 207	4
MATH 293	1
PHYS 201	4
MATH (OR) GENERAL ELECTIVE	3
Total Hours - Fall Semester	**15**

ENGL 102	3
MATH (300-499 level)	6
MATH (OR) GENERAL ELECTIVE	6
Total Hours - Spring Semester	**15**

THIRD YEAR

ECON 201, 202, GEOG 203, PSYC 201 (OR) SOCS 225	3
ENGL 203, 204, 205 (OR) 206	3
MATH (300-499 level)	5-6
MATH (OR) GENERAL ELECTIVE	3-4
Total Hours - Fall Semester	**15**

HIST 201, 202, 207, 208 (OR) POSC 203	3
MATH (300-499 level)	6
MATH (OR) GENERAL ELECTIVE	6
Total Hours - Spring Semester	**15**

FOURTH YEAR

MATH 493	2
MATH (300-499 level)	6
MATH (OR) GENERAL ELECTIVE	7
Total Hours - Spring Semester	**15**

MATH (300-499 level)	6
MATH (OR) GENERAL ELECTIVE	9
Total Hours – Fall Semester	**15**