

# *Biology Education Program*

## OVERVIEW OF THE PROGRAMS

The science education program is designed to provide a strong content background in one or more science disciplines and extensive practice using constructivist teaching strategies to prepare teacher candidates for today's classroom. Certifications (specializations) are available in Biology (9-12), Chemistry (9-12), Physics (9-12) and General Science (5-12). Our program provides early teaching opportunities in middle school classrooms, workshops in association with the NASA IV&V Facility Educator Research Center, and research experiences using a radio telescope at the National Radio Astronomy Observatory in Green Bank, WV.

Science education students earn the B.A. Degree in Education with specializations in two or more science areas. Some students choose to double major, earning both a B.S. in a science discipline (e.g., chemistry or biology) and a B.A. in Education.

## EMPLOYMENT OPPORTUNITIES

Students graduating from Fairmont State with science teaching specializations are typically recruited prior to graduation by area schools and/or by school districts in Maryland, Virginia, and North Carolina. Many graduates begin teaching at the middle school level before moving into a high school position. The biology, chemistry, or physics certification coupled with a general science certification provides the widest range of teaching opportunities. Due to the shortage of physics teachers, graduates with the physics specialization are heavily recruited.

## GRADUATE OPPORTUNITIES

Many science education graduates eventually continue on in their education to pursue a Master of Education (M.Ed.) degree. The Master of Arts in Teaching degree is another new option at Fairmont State for those who already have a bachelor's degree or higher with substantial science content.



## CONTACT INFORMATION

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FOR MORE INFORMATION VISIT

[www.fairmontstate.edu/academics/collegeofscitech/default.asp](http://www.fairmontstate.edu/academics/collegeofscitech/default.asp)

# SCIENCE CONTENT SPECIALIZATIONS

Science education majors choose at least two of the following content specializations, plus required Education courses and the remaining liberal studies requirements. A sample model schedule for General Science and Biology is shown at right.

## GENERAL SCIENCE CONTENT COURSES (39 HOURS)

BIOL 1105	BIOLOGICAL PRINCIPLES I	4
BIOL 1106	BIOLOGICAL PRINCIPLES II	4
CHEM 1105	CHEMICAL PRINCIPLES I	5
CHEM 1106	CHEMICAL PRINCIPLES II	4
GEOL 1101	PHYSICAL GEOLOGY	4
GEOL 1102	HISTORICAL GEOLOGY	4
PHSC 4431	METH. & MAT. IN TEACHING SCIENCE	3
PHYS 1101	INTRODUCTION TO PHYSICS	4
PHYS 1102	INTRODUCTION TO PHYSICS	4
PHYS 2202	ASTRONOMY	3

## BIOLOGY CONTENT COURSES (48 HOURS)

BIOL 1105	BIOLOGICAL PRINCIPLES I	4
BIOL 1106	BIOLOGICAL PRINCIPLES II	4
BIOL 2202	GENERAL BOTANY	4
BIOL 2203	GENERAL ZOOLOGY	4
BIOL 3306	FUNDAMENTALS OF ECOLOGY	4
BIOL 3380	GENETICS	4
CHEM 1105	CHEMICAL PRINCIPLES I	5
CHEM 1106	CHEMICAL PRINCIPLES II	4
CHEM 1113	PRACTICAL SCIENTIFIC STAT. WITH A SPREADSHEET	1
GEOL 1102	HISTORICAL GEOLOGY	4
MATH 1112	COLLEGE ALGEBRA (OR HIGHER)	3
PHYS 1101	INTRODUCTION TO PHYSICS	4
PHSC 4431	METHODS & MATERIALS IN TEACHING SCIENCE	3

## CHEMISTRY CONTENT COURSES (38 HOURS)

CHEM 1105	CHEMICAL PRINCIPLES I	5
CHEM 1106	CHEMICAL PRINCIPLES II	4
CHEM 1113	PRACTICAL SCIENTIFIC STAT. WITH A SPREADSHEET	1
CHEM 2201	ORGANIC CHEMISTRY I	4
CHEM 2205	ANALYTICAL CHEMISTRY	4
CHEM 3301	PHYSICAL CHEMISTRY I	4
CHEM 4405	ADVANCED INTEGRATED LABORATORY	1-2
MATH**1185	APPLIED CALCULUS I	4
-OR-		
MATH**1190	CALCULUS I	4
PHYS 1101/02	INTRODUCTION TO PHYSICS I, II	8
-OR -		
PHYS 1105/06	PRINCIPLES OF PHYSICS I, II	10
PHSC 4431	METHODS & MATERIALS IN TEACHING SCIENCE	3

\*\*Students who do not meet the prerequisites for MATH 1185 or 1190 will be required to take MATH 1112 and/or MATH 1115.

## PHYSICS CONTENT COURSES (43 HOURS)

CHEM 1101/02**	GENERAL CHEMISTRY I, II	8
-OR-		
CHEM 1105/06	CHEMICAL PRINCIPLES I, II	9
PHYS 1105/06	PRINCIPLES OF PHYSICS I, II	10
PHYS 2201	DEMONSTRATIONS IN PHYSICS	2
PHYS 3310	ELECTRICITY AND ELECTRONICS	4
PHYS 3325/35	ADVANCED PHYSICS I, II	8
MATH 1185	APPLIED CALCULUS I	4
-OR-		
MATH 1190	CALCULUS I	4
-OR -		
TECH 2290	ENGINEERING ANALYSIS I	4
MATH 1186	APPLIED CALCULUS II	4
-OR-		
MATH 3315	CALCULUS II	4
-OR-		
TECH 3300	ENGINEERING ANALYSIS II	4
PHSC 4431	METHODS & MATERIALS IN TEACHING SCIENCE	3

\*\*Chemistry 1105/06 is strongly recommended in place of 1101/02, but not required.

# MODEL SCHEDULE

## Secondary Science Education/Biology & General Science (B.S.) 128 Hours

### FRESHMAN FIRST SEMESTER

BIOL 1105	BIOLOGICAL PRINCIPLES I	4
MATH 1115	TRIGONOMETRY	3
EDUC 2200	INTRO TO EDUCATION	3
ENGL 1104	WRITTEN ENGLISH I	3
INFO 1100	COMPUTER CONCEPTS (MAY TEST OUT)	3
		16

### FRESHMAN SECOND SEMESTER

BIOL 1106	BIOLOGICAL PRINCIPLES II	4
ENGL 1108	WRITTEN ENGLISH II	3
COMM 2200 OR 2201 OR 2202		3
SCIE 1020	INTRODUCTION TO METEOROLOGY	4
L.S. CIV		3
		17

### SOPHOMORE FIRST SEMESTER

CHEM 1105	CHEMICAL PRINCIPLES I	5
PHYS 1101	INTRODUCTION TO PHYSICS I	4
EDUC 2201	INSTRUCTIONAL TECHNOLOGY	3
BIOL 2203	ZOOLOGY	4
L.S. ART		3
		19

### SOPHOMORE SECOND SEMESTER

CHEM 1106	CHEMICAL PRINCIPLES II	4
CHEM 1113	PRAC SCIENTIFIC STATS	1
EDUC 2202	HUMAN GROWTH & DEV	3
EDUC 2202L	HUMAN GROWTH & DEV CLIN II	1
PHYS 1102	INTRODUCTION TO PHYSICS II	4
BIOL 2202	GENERAL BOTANY	4
		17

### JUNIOR FIRST SEMESTER

BIOL 3306	FUNDAMENTALS OF ECOLOGY	4
GEOL 1101	PHYSICAL GEOLOGY	4
EDUC 3331	READING IN CONTENT AREA	3
PHSC 4430	SCIENCE INTEGRATION SEMINAR	1
L.S. HUM		3
L.S. CIV		3
		18

### JUNIOR SECOND SEMESTER

GEOL 1102	HISTORICAL GEOLOGY	4
PHSC 4431	METHODS & MATERIALS	3
EDUC 3351&CLIN	INCLUSIVE CLASSROOM PRACTICES	4
EDUC 3352&CLIN	EDUCATIONAL PSYCHOLOGY	4
ELECTIVE		3
		18

### SENIOR FIRST SEMESTER

BIOL 3380	GENETICS	4
PHYS 2202	ASTRONOMY (ODD YRS)	4
L.S. HUM		3
L.S. CIV		3
L.S. ART		3
		17

### SENIOR SECOND SEMESTER

EDUC 3395	SECONDARY CLASSROOM ORG	4
EDUC 4495	STUDENT TEACHING CLINICAL	8
		12