Programs of Study

College of Science & Technology

Dr. Donald Trisel, Interim Dean
302c Engineering Technology Building / (304) 367-4156
Donald.Trisel@fairmontstate.edu

Department of Biology, Chemistry and Geoscience

Dr. Steven K. Roof, Chair
319 328B Hunt Haught Hall / (304) 367-4363
Steven.Roof@fairmontstate.edu

FACULTY

BAUR, ANDREAS (2000)
Professor of Chemistry

BAXTER, HARRY N., III (1985)
Professor of Chemistry

CASTO, PAMELA (2009)
FEAP

COOK, RACHEL (2015)
Temporary Assistant Professor of Biology

ENSIGN, TODD (2005)
FEAP

FLOOD, MARK R. (1994)
Professor of Biology

FORD, JAIME (2015)
FEAP

HAHN, DAVID (2015)
Temporary Instructor of Chemistry

HARVEY, ERICA L. (1994)
Professor of Chemistry

HEMLER, DEBRA A. (2000)
Coordinator of Geoscience
Professor of Geoscience
Graduate Faculty

Associate Professor of Biology

MAGRO, ALBERT (1992)
Professor/Senior Level: Biology

MORRIS, TONY E. (1994)
Professor of Biology

RAOL, MARCIE (2013)
Temporary Assistant Professor of Geoscience Education

ROOF, STEVEN K. (1994)
Professor of Biology

SCANLON, MATTHEW (1991)
Professor of Chemistry

Professor of Biology
PRE-DENTAL CURRICULUM

Students planning to study dentistry should complete basic science courses as well as a broad range of general education courses with better than a “B” average. Students should carefully consult the catalog of the professional school that they plan to attend. At West Virginia University, the School of Dentistry requires applicants to have completed three or more academic years of work (90 semester hours) in the liberal arts, including the following specific course requirements:

- **Biol 1105, 1106 Biological Principles I, II**
- **Chem 1105, 2200 Chemical Principles, Foundational**
- **Biochemistry**
- **Chem 2201, 2202 Organic Chemistry I, II**
- **Engl 1104, 1108 Written English I, II**
- **Phys 1101, 1102 Introduction to Physics I, II**

Courses in the humanities, social sciences, and advanced courses in biology are also suggested in order to acquire a broadened intellectual background.

PRE-MEDICAL CURRICULUM

Students planning to study medicine or veterinary medicine should complete basic science courses as well as a broad range of general education courses with better than a “B” average. Students should carefully consult the catalog of the professional school that they plan to attend. At West Virginia University, the School of Medicine requires a minimum of 90 semester hours of undergraduate work (excluding physical education and ROTC courses) for admission. Pre-medical students should work towards fulfilling the requirements for the bachelor's degree in biology, chemistry, or forensic science. Students selecting other majors will still need to complete the minimum course requirements shown below.

The following courses will meet the minimum requirements for admission to the School of Medicine at West Virginia University:

- **Biol 1105, 1106 Biological Principles I, II**
- **Chem 1105, 2200 Chemical Principles, Foundational**
- **Biochemistry**
- **Chem 2201, 2202 Organic Chemistry I, II**
- **Engl 1104, 1108 Written English I, II**
- **Phys 1101, 1102 Introduction to Physics I, II**

Six hours of coursework in social or behavioral science is also required, but no particular courses are specified. Additional courses in the humanities, social sciences, and advanced courses in biology are suggested in order to acquire a broadened intellectual background.

PRE-MEDICAL TECHNOLOGY CURRICULUM

Medical Technology is a four-year undergraduate program. The first two years may be taken at Fairmont State University. The entrance requirements of schools of medical technology throughout the nation vary considerably; students should carefully consult the catalog of the school that they plan to attend. Students who have completed 60 semester hours, including the following courses, may be eligible for admission to the third year of the medical technology program at West Virginia University.

- **Engl 1104, 1108 Written English I, II**
- **Biol 1105, 1106 Biological Principles I, II**
- **Chem 1105, 2200 Chemical Principles, Foundational**
- **Biochemistry**
- **Chem 2201, 2202 Organic Chemistry I, II**
- **Math 1112 College Algebra**
- **Math 1113 Applied Statistics**

The other classes should total 21 to 24 hours of core classes. Courses such as microbiology, biochemistry and anatomy should not be taken prior to enrollment in the medical technology program.

PRE-PHARMACY CURRICULUM

Many schools of pharmacy offer a doctorate of pharmacy that requires six years of study beyond high school, two years of pre-pharmacy and four years of study in a professional school of pharmacy. Prospective pharmacy students should plan their programs to meet the requirements of the particular professional school of pharmacy to which they plan to transfer. The following two-year preparatory program is suggested for students applying to the WVU School of Pharmacy and Marshall University School of Pharmacy. Elective slots in the model schedule should be filled with courses that satisfy required general education credits at the pharmacy school. Students without the necessary prerequisites for calculus will be required to take **Math 1115 or 1112 and 1115**. The pre-pharmacy advisor should be consulted prior to scheduling each semester.

- **Biol 1105, 1106 Biological Principles I, II**
- **Biol 2205, 2206 Technical Microbiology (Lecture and Lab)**
- **Chem 1105, 2200 Chemical Principles, Foundational**
- **Biochemistry**
- **Chem 2201, 2202 Organic Chemistry I, II**
- **Engl 1104, 1108 Written English I, II**
- **Math 1112 College Algebra**
- **Math 1113 Applied Statistics**
- **Math 1115 or 1112 and 1115**
- **Biol 2211, 2212 Economic Principles and Problems I, II**
- **Engl 1104, 1108 Written English I, II**
- **Math 1113 Applied Statistics**
- **Biol 2310 Business and Economics Statistics**
- **Math 1185 Applied Calculus**
- **Math 1190 Calculus I**
- **Phys 1101, 1102 Introduction to Physics I, II**
- **Comm 2200 Introduction to Human Communication**
PRE-PHYSICAL THERAPY CURRICULUM

This curriculum is designed to satisfy the course requirements for admission to the professional portion of the curriculum in physical therapy offered by the West Virginia University (WVU) School of Medicine. Fairmont State University (FSU) students must select a major and complete a bachelor’s degree prior to application for WVU’s Doctorate of Physical Therapy (DPT) program. All applicants to the DPT program are required to have a bachelor’s degree before admission. Information on prerequisite equivalent coursework is provided below. Degrees in biology, chemistry, and forensic science meet many of these prerequisites. Applicants with degrees in any area (i.e. exercise science, philosophy, psychology, etc.) are encouraged to apply, as long as the equivalent prerequisite coursework has been completed. A course in medical terminology, such as HLCA 1100, is recommended, but not required.

Students interested in admission to a physical therapy program at an institution other than WVU should consult with the pre-physical therapy advisor for assistance in getting the information about the course requirements at the other institution.

- DPT prerequisite course requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>BIOL 1105, 1106</td>
<td>BIOLOGICAL PRINCIPLES I, II</td>
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<tr>
<td>CHEM 1105, 2200</td>
<td>CHEMICAL PRINCIPLES, FOUNDATIONAL BIOCHEMISTRY</td>
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<tr>
<td>MATH 1113</td>
<td>APPLIED STATISTICS</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>BSBA 3310</td>
<td>BUSINESS AND ECONOMICS STATISTICS</td>
</tr>
<tr>
<td>PHYS 1101, 1102</td>
<td>INTRODUCTION TO PHYSICS I, II</td>
</tr>
<tr>
<td>PSYC 1101</td>
<td>INTRODUCTION TO PSYCHOLOGY I</td>
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<tr>
<td>PSYC 3330</td>
<td>DEVELOPMENTAL PSYCHOLOGY</td>
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<td>ATTR* 219</td>
<td>HUMAN ANATOMY (RECOMMENDED)</td>
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<tr>
<td>NBAN** 205</td>
<td>HUMAN ANATOMY</td>
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<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>PSIO****41</td>
<td>HUMAN PHYSIOLOGY (RECOMMENDED)</td>
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<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>BIOL***235</td>
<td></td>
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</table>

* must take the WVU course; contact WVU Dept. of Anatomy
** this course available on the web; must take the WVU course; contact WVU Department of Anatomy
*** must take the WVU course; contact WVU Dept. of Physiology
**** this course is available on the web via the WVU Department of Physiology

BIOLOGY

Biology, the study of life, is a wide-ranging and rapidly growing discipline. Understanding biology requires a working knowledge of all the sciences, especially chemistry and mathematics. The biology program at FSU strives to provide students with a broad-based education in all fields of biology as well as a fundamental knowledge of chemistry and mathematics. Students are required to complete basic courses in biology designed to provide a comprehensive understanding of living organisms. Electives allow students the flexibility to gain additional knowledge in an area of interest. No minor is required for biology majors.

A four-year B.S. degree in biology will prepare students to compete for entry level jobs such as lab technician, wildlife biologist, research scientist or naturalist, among others. While a bachelor’s degree in biology will help students get a job, many careers require additional education beyond the B.S. degree. Many of our best students compete successfully for admission to graduate study at institutions across the country. A biology degree will also provide pre-professional training required by fields such as dentistry, medicine, pharmacy, and veterinary medicine.

Students who major in biology select one of the following degree programs:

1) the B.S. in Biology degree as preparation for employment, professional school or graduate study
2) the B.S. in Biology degree with an emphasis in biotechnology as preparation for employment, professional school, or graduate study
3) the B.A. in Education degree with a specialization in biology, as preparation for teaching biology in grades 9-Adult. All courses must be completed prior to admission to Secondary Student Teaching/Clinical III.

In addition to meeting the graduation requirements listed for the B.S. in Biology or B.A. in Education degree, students must also:

1) obtain a grade of “C” or better in BIOL 1105, 1106, 2202, and 2203
2) successfully complete an assessment exam during their final year (This exam is given every spring semester.)

BACHELOR OF SCIENCE IN BIOLOGY .... 120 SEM. HRS.

Biology Curriculum (see below) 58 SEM. HRS.
No Minor Required
General Studies Requirements 35 SEM. HRS.
(See “Degree Requirements” for General Studies requirements not completed through the major)
Free Electives 27 SEM. HRS.

- Biology Curriculum 58 SEM. HRS.

Required courses (46 hrs)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tr>
<td>BIOL 1105</td>
<td>BIOLOGICAL PRINCIPLES I</td>
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<tr>
<td>BIOL 1106</td>
<td>BIOLOGICAL PRINCIPLES II</td>
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<tr>
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<td>GENERAL BOTANY</td>
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<tr>
<td>BIOL 2203</td>
<td>GENERAL ZOOLOGY</td>
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<tr>
<td>BIOL 3306</td>
<td>FUNDAMENTALS OF ECOLOGY</td>
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<tr>
<td>BIOL 3368</td>
<td>ANIMAL PHYSIOLOGY</td>
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<td>OR</td>
<td></td>
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<tr>
<td>BIOL 3370</td>
<td>PLANT PHYSIOLOGY</td>
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<tr>
<td>BIOL 3380</td>
<td>GENETICS</td>
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<tr>
<td>BIOL 3390</td>
<td>MOLECULAR BIOTECHNOLOGY</td>
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<tr>
<td>BIOL 4485</td>
<td>SENIOR SEMINAR</td>
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<tr>
<td>CHEM 1105</td>
<td>CHEMICAL PRINCIPLES</td>
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<tr>
<td>CHEM 2200</td>
<td>FOUNDATIONAL BIOCHEMISTRY</td>
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<tr>
<td>CHEM 2201</td>
<td>ORGANIC CHEMISTRY I</td>
</tr>
<tr>
<td>CHEM 2202</td>
<td>ORGANIC CHEMISTRY II</td>
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- Biology Electives 12 SEM. HRS.

<table>
<thead>
<tr>
<th>Course Code</th>
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<tr>
<td>BIOL 2224</td>
<td>MICROBIOLOGY</td>
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<td>BIOL 3312</td>
<td>ADVANCED BOTANY</td>
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<td>BIOL 3315</td>
<td>INVERTEBRATE ZOOLOGY</td>
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<td>BIOL 3316</td>
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<td>BIOL 3330</td>
<td>AQUATIC ECOLOGY</td>
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<td>BIOL 3331</td>
<td>TERRESTRIAL ECOLOGY</td>
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<td>BIOL 3360</td>
<td>BIOCHEMISTRY</td>
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<td>BIOL 4420</td>
<td>DEVELOPMENTAL BIOLOGY</td>
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<td></td>
<td><strong>MINOR IN BIOLOGY</strong></td>
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<tr>
<td>BIOL 1105</td>
<td>BIOLOGICAL PRINCIPLES I</td>
</tr>
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<td>BIOL 1106</td>
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<tr>
<td>BIOL 2202</td>
<td>GENERAL BOTANY</td>
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<tr>
<td>BIOL 2203</td>
<td>GENERAL ZOOLOGY</td>
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<tr>
<td></td>
<td><strong>ELECTIVES</strong> (8 hrs.)</td>
</tr>
<tr>
<td></td>
<td>Students may choose from any biology course of level 1199 or higher.</td>
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</table>

**BACHELOR OF ARTS IN EDUCATION:**

**SPECIALIZATION IN BIOLOGY**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BIOL 1105</td>
<td>BIOLOGICAL PRINCIPLES I</td>
<td>4</td>
</tr>
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<td>BIOL 1106</td>
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<tr>
<td>BIOL 2202</td>
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<td>BIOL 2203</td>
<td>GENERAL ZOOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 2204</td>
<td>HISTORICAL GEOLOGY</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 2200</td>
<td>FOUNDATIONAL BIOCHEMISTRY</td>
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<tr>
<td>GEOL 1102</td>
<td>HISTORICAL GEOLOGY</td>
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<tr>
<td>MATH 1115</td>
<td>TRIGONOMETRY</td>
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<td>MATH 1102</td>
<td>APPLIED TECHNICAL MATHEMATICS II</td>
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<tr>
<td>PHYS 1101</td>
<td>INTRODUCTION TO PHYSICS I</td>
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<td>PHSC 4430</td>
<td>SCIENCE INTEGRATION SEMINAR</td>
<td>1</td>
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<td>PHSC 4431</td>
<td>METHODS AND MATERIALS IN TEACHING SCIENCE</td>
<td>3</td>
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<tr>
<td>SCIE 1120</td>
<td>METEOROLOGY</td>
<td>4</td>
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<tr>
<td></td>
<td><strong>FREE ELECTIVES</strong> (8 hrs.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students may choose from any biology course of level 1199 or higher.</td>
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</table>

**MINOR IN BIOLOGY**

**Required courses (16 hrs.)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1105</td>
<td>BIOLOGICAL PRINCIPLES I</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 1106</td>
<td>BIOLOGICAL PRINCIPLES II</td>
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</tr>
<tr>
<td>BIOL 2202</td>
<td>GENERAL BOTANY</td>
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<tr>
<td>BIOL 2203</td>
<td>GENERAL ZOOLOGY</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>ELECTIVES</strong> (8 hrs.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students may choose from any biology course of level 1199 or higher.</td>
<td></td>
</tr>
</tbody>
</table>
2) The B.S. in Chemistry with an emphasis in biotechnology provides chemistry majors with an additional grounding in biology and prepares students for professional schools and graduate study in forensic science and pharmaceutical sciences.

3) The B.A. in Education with a specialization in chemistry equips the graduate to teach chemistry in any secondary school or to pursue graduate studies in science education.

**BACHELOR OF SCIENCE**

**IN CHEMISTRY** .................................................. 120 SEM. HRS.

Chemistry Curriculum (see below)* .......... 57-59 SEM. HRS.
General Studies Requirements ............... 42-45 SEM. HRS.
Free Electives* ........................................... 16-21 SEM. HRS.
No Minor Required

*Choosing higher-credit hour alternatives in the major curriculum reduces the minimum number of free elective credit hours required to reach 120 semester hours.

- Chemistry Curriculum .................... 57-59 SEM. HRS.

**Required courses (57-59 hrs.)**

**CHEM 1105** CHEMICAL PRINCIPLES ....................... 5
**CHEM 2200** FOUNDATIONAL BIOCHEMISTRY .............. 4
**CHEM 2201** ORGANIC CHEMISTRY I ........................ 4
**CHEM 2202** ORGANIC CHEMISTRY II ...................... 4
**CHEM 2205** ANALYTICAL CHEMISTRY .................... 4
**CHEM 3315** INSTRUMENTAL ANALYSIS .................... 4
**CHEM 3301** PHYSICAL CHEMISTRY I ...................... 4
**CHEM 3304** INORGANIC CHEMISTRY ..................... 4
**CHEM 4404** SYNTHETIC METHODS AND MATERIALS ........ 4
**CHEM 4412** PHYSICAL CHEMISTRY II ..................... 4
**BIOL 3360** BIOCHEMISTRY .................................. 4
**PHYS 1101** INTRODUCTION TO PHYSICS I ................. 4
-OR-
**PHYS 1105** PRINCIPLES OF PHYSICS I .................. 5
**PHYS 1102** INTRODUCTION TO PHYSICS II ................ 4
-OR-
**PHYS 1106** PRINCIPLES OF PHYSICS II .................. 5
**MATH**1185 APPLIED CALCULUS I .......................... 4
-OR-
**MATH**1190 CALCULUS I .................................. 4
**MATH 1186** APPLIED CALCULUS II .......................... 4
-OR-
**MATH 3315** CALCULUS II ................................. 4

*Note: MATH 1185 (or MATH 1190) is required for the chemistry major; the hours for this course are counted under General Studies requirements, Attribute IB.

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

- Additional requirements for Biotechnology Emphasis ......................... 19 SEM. HRS.

**BIOL 1105** BIOLOGICAL PRINCIPLES I ..................... 4
**BIOL 1106** BIOLOGICAL PRINCIPLES II .................... 4
**BIOL 3380** GENETICS ........................................ 4
**BIOL 3390** MOLECULAR BIOTECHNOLOGY .................. 4
**MATH 1113** APPLIED STATISTICS ........................... 3

**CHEMISTRY**

The mission of the Chemistry Program at Fairmont State is to help students learn chemistry, and how it connects to computers, mathematics, biology and physics. The program strives to foster excellent oral and written communication skills, and is approved by the American Chemical Society. With small class sizes, innovative teaching approaches, and hands-on access to modern, research-quality instrumentation, students can develop the analytical, problem-solving and teamwork skills necessary to successfully pursue science-based careers. A student completing the B.S. degree with a major in chemistry will be competitive for graduate study in chemistry or chemical engineering, laboratory positions in the chemical industry, pharmaceutical industry or government agencies, or application to law school. By electing a few additional biology classes, students completing a B.S. degree in chemistry will be prepared for application to a variety of professional and graduate schools, including medical school, dental school, veterinary school, pharmacy school, physical therapy programs, toxicology, pharmaceutical science and forensic science graduate programs.

Programs available for students who wish to specialize in chemistry include:

1) The B.S. in Chemistry is certified by the American Chemical Society and provides a well-balanced program of courses in the major fields of chemistry, as well as mathematics and physics. A student completing this program will be a competitive candidate for graduate study or positions in industry or government agencies.
• General Studies Requirements ............ 42-45 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 2220 or any other in IA ........................................... 3
Attribute IB – Quantitative Literacy
MATH 1185/90 ................................................................. 4
Attribute IC – Written Communication
ENGL 1104 (students exempt from ENGL 1104 consult academic advisor) ........................................... 3
Attribute ID – Teamwork
CHEM 4412 (SATISFIED IN MAJOR) ........................................... X
Attribute IE – Information Literacy
ENGL 1108 ........................................................................ 3
Attribute IF – Technology Literacy
BISM 1200 or any other in IF except ENGL 1109 ........................................... 3
Attribute IG – Oral Communication
COMM 2200 or 2201 or 2202 ........................................... 3
Attribute II – Citizenship
Any course in II ................................................................. 3
Attribute IV – Ethics
ENGL 2220 or any other in IV ........................................... 3
Attribute V – Health
PHED 1100 or any other course in V ........................................... 2-5
Attribute VI – Interdisciplinary
Any course in VI ................................................................. 3
Attribute VII A – Arts
Any course or combination of courses in VIIA ........................................... 3
Attribute VII B – Humanities
HIST 1107/08 or any other course in VIIB ........................................... 3
Attribute VII C – Social Sciences
GEOG 2210 or any other course in VIIIC ........................................... 3
Attribute VII D – Natural Science
CHEM 1105 (SATISFIED IN MAJOR) ........................................... X
Attribute VII E – Cultural Awareness
GEOG 2210 or any other course in VIII ........................................... 3
Additional General Studies hours
CHEM 3301 (SATISFIED IN MAJOR) ........................................... X
(WRITING INTENSIVE COURSE)

**Note: Students with ACT Math less than 21 will need an extra year to take developmental or other prerequisite Math courses and CHEM 1101.

**Note: Students with ACT Math higher than 22 should start in the first semester with the highest math course they can place into, which may be Trigonometry (ACT MATH 23), Applied Calculus I (ACT Math 24) or Calculus I (ACT Math 25). This will preserve more options for minors and possible double majors.

Note: Math ACT requirements may be satisfied by COMPASS score equivalents.

MINOR IN CHEMISTRY ............................................. 21 SEM. HRS

Required courses (9 hrs.)
CHEM 1105 CHEMICAL PRINCIPLES ........................................... 5
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY ........................................... 4

Minor Electives (12 hrs.)

Any three additional courses with CHEM prefix except CHEM 1101 and CHEM 1102.

BACHELOR OF ARTS IN EDUCATION: SPECIALIZATION IN CHEMISTRY

GRADES 9-ADULT ............................................. 120 SEM. HRS.

Chemistry Curriculum (see below) ............ 45-47 SEM. HRS.*

General Studies Requirements ............. 30 SEM. HRS.

Professional Education Courses ............. 39 SEM. HRS.
Free Electives ............................................. 4-6 SEM. HRS.*

No Minor Required

(See “Degree Requirements” for General Studies requirements not completed through the major)

*Choosing higher-credit hour alternatives in the chemistry curriculum reduces the minimum number of free elective credit hours required to reach 128 semester hours.

• Chemistry Curriculum ......................... 45-47 SEM. HRS.

Required courses (45-47 hrs).

BIOL 1105 PRINCIPLES OF BIOLOGY I ........................................... 4
CHEM 1105 CHEMICAL PRINCIPLES ........................................... 5
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY ........................................... 4
CHEM 2201 ORGANIC CHEMISTRY I ........................................... 4
CHEM 3301 PHYSICAL CHEMISTRY I ........................................... 4
CHEM 3304 INORGANIC CHEMISTRY ........................................... 4
GEOL 1101 PHYSICAL GEOLOGY ........................................... 4
MATH**1185 APPLIED CALCULUS I ........................................... 4
MATH**1190 CALCULUS I ........................................... 4
PHSC 4430 INTEGRATED SCIENCE SEMINAR ........................................... 1
PHSC 4431 METHODS AND MATERIALS IN TEACHING SCIENCE ........................................... 3
PHYS 1101/02 INTRODUCTION TO PHYSICS I, II ........................................... 8
PHYS 1105/06 PRINCIPLES OF PHYSICS I, II ........................................... 10

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

All courses in the specialization must be completed prior to admission to Secondary Student Teaching/Clinical III.

• Professional Education ......................... 39 SEM. HRS.

EDUC 2200 INTRO TO EDUCATION ........................................... 3
EDUC 2201 INSTRUCTIONAL TECHNOLOGY ........................................... 3
EDUC 2203 HUMAN DEVELOPMENT, LEARNING & TEACHING ........................................... 3
EDUC 2240 HIGH INCIDENCE DISABILITIES FOR EDUCATORS ........................................... 3
EDUC 2260 INSTRUCTIONAL DESIGN I ........................................... 3
EDUC 2265 FIELD EXPERIENCE ........................................... 1
EDUC 3331 READING IN THE CONTENT AREAS ........................................... 3
EDUC 3340 INSTRUCTIONAL DESIGN II ........................................... 3
EDUC 3351 INCLUSIVE CLASSROOM PRACTICES ........................................... 3
EDUC 3365 FIELD EXPERIENCE ........................................... 2
EDUC 4485 ACTION RESEARCH ........................................... 1
EDUC 4486 PORTFOLIO ........................................... 1
EDUC 4496 SECONDARY STUDENT TEACHING ........................................... 10

• General Studies Requirements ............. 30 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 1108 (required) ................................................................. 3
Attribute IB – Quantitative Literacy
MATH 1185 or 1190 ................................................................. 4
Attribute IC – Written Communication
ENGL 1104 (required) ................................................................. 3
Attribute ID – Teamwork
COMM 2200 or any other ID ................................................................. 3
### Forensic Science Curriculum

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>ORGANIC CHEMISTRY I</td>
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<td>CHEM 2205</td>
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<td>CHEM 3315</td>
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<td>FORS 2201</td>
<td>INTRODUCTION TO FORENSIC SCIENCE</td>
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<td>FORS 2225</td>
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<td>FORS 3385</td>
<td>RESEARCH IN FORENSIC SCIENCE</td>
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<td>FORS 4401</td>
<td>CAPSTONE SEMINAR IN FORENSIC SCIENCE</td>
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### General Studies Requirements

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<tr>
<td>IA</td>
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<td>V</td>
<td>CRIM 2212</td>
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<td>VI</td>
<td>Attribute II with POLI 1103</td>
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<td>VII</td>
<td>ANY COURSE LISTED IN VI, Attribute II – Humans</td>
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<td>History or Literature that also counts for Attribute VIII</td>
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<td>IX</td>
<td>Attribute II with POLI 1103</td>
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<td>Met in Attribute V with CRIM 2212</td>
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<td>Attribute II – Natural Science</td>
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<td>XII</td>
<td>PHYS 1101 or 1105</td>
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<td>XII</td>
<td>History or Literature that also counts for Attribute VIII</td>
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<td>XIII</td>
<td>Additional General Studies Hours</td>
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<tr>
<td>XIV</td>
<td>PHYS 1102 and 1106</td>
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<tr>
<td>XV</td>
<td>Writing Intensive Course met with BIOL 3390 in Major Requirements</td>
</tr>
</tbody>
</table>

**Bachelor of Science in Forensics... 120 SEM. HRS.**

Forensic Science Curriculum (see below)\(.*\) 71 SEM. HRS.

General Studies Requirements (includes specific courses required for the major)... 39-41 SEM. HRS.

Electives\(.*\) 8-10SEM. HRS.

No Minor Required

\(.*\) Choosing higher-credit hour alternatives in the major curriculum reduces the minimum number of free elective credit hours required to reach 128 semester hours.

**FORENSICS**

The Forensics degree consists of a Forensic Science major that includes forensic science, biology, chemistry, mathematics, physics, and courses that prepare students for graduate school and/or employment in scientific laboratories. In addition, an emphasis in biotechnology is available. Candidates for the degree must complete the General Studies requirements as described in the Degree Requirements chapter of this catalog. Students completing the requirements for the Forensic Science major will automatically earn a minor in chemistry.

For forensic science majors, the required science courses satisfy the General Studies scientific discovery requirement and the required math course satisfies the General Studies math requirement. Students interested in graduate school will need to complete additional upper-level science courses. ACT prerequisites for required science and math courses are listed in the catalog under the course description for each course. Students entering with an ACT science reasoning score of 21 or better, ACT Math score of 24 or higher, two units of high school algebra, one unit of high school geometry and one unit of high school trigonometry will be prepared for all courses. Students not meeting this list of prerequisites will need to take specific additional courses and should consult with the forensic science advisor immediately.

### BACHELOR OF SCIENCE IN FORENSICS ...

120 SEM. HRS.

Forensic Science Curriculum (see below)\(.*\) ... 71 SEM. HRS.

General Studies Requirements (includes specific courses required for the major)... 39-41 SEM. HRS.

Electives\(.*\) 8-10SEM. HRS.

No Minor Required
GENERAL SCIENCE
(TEACHING SPECIALIZATION ONLY)

A general science specialization for grades 5-adult is offered for the B.A. in Education degree, in conjunction with the School of Education. This specialization is typically chosen to accompany one of the discipline-based science specializations, such as the biology, chemistry or physics specialization.

BACHELOR OF ARTS IN EDUCATION:
SPECIALIZATION IN GENERAL SCIENCE
GRADES 5-ADULT ........................................... 120 SEM. HRS.
General Science Curriculum (see below) .......... 48 SEM. HRS.
General Studies Requirements ........................ 30 SEM. HRS.
(See “Degree Requirements” for General Studies requirements not completed through the major)
Professional Education Courses ..................... 39 SEM. HRS.
Free Electives ................................................ 3 SEM. HRS.

• General Science Curriculum ................... 48 SEM. HRS.

Required Courses (48 hrs.)

BIOL 1105 BIOLOGICAL PRINCIPLES I ......................... 4
BIOL 1106 BIOLOGICAL PRINCIPLES II ....................... 4
CHEM 1105 CHEMICAL PRINCIPLES ......................... 5
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY ................. 4
GEOL 1101 PHYSICAL GEOLOGY ................................. 4
GEOL 1102 HISTORICAL GEOLOGY ............................ 4
MATH 1115 TRIGONOMETRY & ELEMENTARY FUNCTIONS .......... 3
PHYS 1101 INTRODUCTION TO PHYSICS I .................. 4
PHYS 1102 INTRODUCTION TO PHYSICS II ............... 4
PHYS 2202 ASTRONOMY ........................................... 3
PHSC 4430 SCIENCE INTEGRATION SEMINAR ................. 1
PHSC 4431 METHODS AND MATERIALS IN TEACHING SCIENCE .. 3
SCIE 1120 INTRODUCTION TO METEOROLOGY .............. 4

*All courses must be completed prior to admission to Secondary Student Teaching/Clinical III.

• Professional Education .......................... 39 SEM. HRS.

EDUC 2200 INTRO TO EDUCATION .............................. 3
EDUC 2201 INSTRUCTIONAL TECHNOLOGY .................. 3
EDUC 2203 HUMAN DEVELOPMENT, LEARNING & TEACHING ...... 3
EDUC 2240 HIGH INCIDENCE DISABILITIES FOR EDUCATORS ...... 3
EDUC 2260 INSTRUCTIONAL DESIGN ........................... 3
EDUC 2265 FIELD EXPERIENCE 2 ............................... 1
EDUC 3331 READING IN THE CONTENT AREAS .................. 3
EDUC 3340 INSTRUCTIONAL DESIGN II ..................... 3
EDUC 3351 INCLUSIVE CLASSROOM PRACTICES ................. 3
EDUC 3365 FIELD EXPERIENCE 3 ................................. 2
EDUC 4485 ACTION RESEARCH .................................. 1
EDUC 4486 PORTFOLIO ............................................ 1
EDUC 4496 SECONDARY STUDENT TEACHING .................. 10

• General Studies Requirements ..................... 30 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 1108 (required) ........................................... 3
Attribute IB – Quantitative Literacy
MATH 1115 ............................................................ 3
Attribute IC – Written Communication
ENGL 1104 (required) ........................................... 3

Attribute II – Technology Literacy
EDUC 2201 .......................................................... X

Attribute III – Citizenship
POLI 1103 or any other III ....................................... 3

Attribute IV – Ethics
ENGL 2220 or any other course in IV ......................... 3

Attribute V – Health
Any course in V .................................................. 3

Attribute VI – Interdisciplinary
POLI 1103 .......................................................... X

Attribute VIIA – Arts
Any course or combination of courses in VIIA ................ 3

Attribute VIIIB – Humanities
ENGL 2220 or any other course in VIIIB ..................... X

Attribute VIIIC – Social Sciences
GEOG 2210 or any other course in VIIIC ..................... 3

Attribute VIIID – Natural Science
CHEM 1105 (SATISFIED IN MAJOR) ......................... X

Attribute VIII – Cultural Awareness
Any course in VIII ............................................... 3

Additional General Studies hours
EDUC 3331, EDUC 3351 (SATISIFIED IN MAJOR) ................. X
(WRITING INTENSIVE COURSES)

GEOLOGY

Geology is offered as a fulfillment of the General Studies requirement and as an integral part of various science-oriented teaching fields.

Department of Computer Science, Mathematics, and Physics

Dr. Mahmood Hossain, Interim Chair
201G Engineering Technology Building / (304) 367-4967
Mahmood.Hossain@fairmontstate.edu

FACULTY

BAKER, RANDALL (1986)
Assistant Professor of Computer Science
BLACKWOOD, BRIAN (2012)
Assistant Professor of Mathematics

DEVINE, THOMAS (2015)
Temporary Assistant Professor of Computer Security
DUNLEVY, JAMES O. (1965-69; 1972)
Associate Professor of Mathematics
COMP 2201 MACHINE ORGANIZATION ............................. 3
COMP 2230 NETWORK PROGRAMMING .......................... 3
COMP 2270 DATA STRUCTURES ...................................... 3
COMP 3300 COMPUTER GRAPHICS ................................. 3
-OR-
COMP 3310 ARTIFICIAL INTELLIGENCE ........................... 3
COMP 3330 ANALYSIS OF ALGORITHMS ........................... 3
COMP 3340 OPERATING SYSTEMS ................................ 3
COMP 3395 ETHICAL ISSUES IN COMPUTING .................... 3
COMP 4400 AUTOMATA AND LANGUAGE DESIGN ................ 3
COMP 4410 DATABASE MANAGEMENT ............................... 3
COMP 4440 SOFTWARE ENGINEERING ............................... 4
MATH 1170 INTRODUCTION TO MATHEMATICAL ANALYSIS ....... 4
MATH 1190 CALCULUS I .............................................. 4
MATH 3315 CALCULUS II ............................................. 4
MATH 2200 MATHEMATICAL LOGIC ................................ 3
-OR-
MATH 3362 LINEAR ALGEBRA ........................................ 3
MATH 2216 INTRODUCTION TO DISCRETE MATHEMATICS ...... 3
PHYS 1105 PRINCIPLES OF PHYSICS I ............................. 5
PHYS 1106 PRINCIPLES OF PHYSICS II ............................ 5

• General Studies Requirements ............................... 39-40 SEM. HRS.

- Attribute IA – Critical Analysis
  ENGL 1108 Written English II ..................................... 3
- Attribute IB – Quantitative Literacy
  MATH 1190 Calculus I ........................................... X
- Attribute IC – Written Communication
  ENGL 1104 Written English I ..................................... 3
- Attribute ID – Teamwork
  Met in IG with COMM 2200 .................................X
- Attribute IE – Information Literacy
  Met in IA with ENGL 1108 ................................ X
- Attribute IF – Technology Literacy
  TECH 1100 Technology and Society OR Choice ................ 3
- Attribute IG – Oral Communication
  COMM 2200 Introduction to Human Communication .......... 3
- Attribute II – Citizenship
  Any course .............................................................. 3
- Attribute IV – Ethics
  Any course .............................................................. 3
- Attribute V – Health
  PHED 1100 Fitness and Wellness OR Choice .................... 2-3
- Attribute VI – Interdisciplinary
  Any course .............................................................. 3
- Attribute VIIA – Fine Arts
  Any course .............................................................. 3
- Attribute VIIIA – Humanities
  Any course .............................................................. 3
- Attribute VIIIC – Social Science
  Any course .............................................................. 3
- Attribute VIIID – Natural Science
  Any course except PHYS courses ............................... 4-5
- Attribute VIII – Cultural Awareness
  Any course .............................................................. 3

HANSEN, GALEN J. (1994)
Professor of Physics

HOSSAIN, MAHMOOD (2006)
Associate Professor of Computer Science

JONES, STEPHANIE (2015)
Assistant Professor of Mathematics

LARUE, A. DENNINE (2006)
Temporary Assistant Professor of Mathematics

LARUE, THEODORE K. (1982)
Assistant Professor of Computer Science

NIICHEL, ROBERT (2014)
Temporary Assistant Professor of Mathematics

RIESSEN, JOSEPH (1992)
Professor of Mathematics
Graduate Faculty

COMPUTER SCIENCE

Computer Science is the study of the theoretical foundations of computing and their applications in computer systems. It involves the study and implementation of algorithmic processes that describe and transform information. Computer Science is intended for students with career objectives in a wide range of computing and computer-related professions, e.g., computer programmers, system analysts, software engineers, database designers, security analysts, etc. The Computer Science program at FSU offers two majors: one in Computer Science and one in Computer Security. In addition to receiving the necessary skills in computer science, the students also receive a well-balanced mathematics and general studies curriculum.

Computer Science is a broad discipline that encompasses many areas of specialization, with an ever-growing array of opportunities. The B.S. in Computer Science at Fairmont State University has been designed to provide students with an understanding of the field that is broad enough for them to find employment in a wide spectrum of private companies or government agencies and make them competitive for graduate school and advanced study.

NOTES: It is highly recommended that students attempt to complete COMP 1102, COMP 1108, and MATH 1190 by the end of their freshman year.

BACHELOR OF SCIENCE IN COMPUTER SCIENCE
MAJOR IN COMPUTER SCIENCE ............................. 120 SEM. HRS.
Computer Science Curriculum ............................ 71 SEM. HRS.
General Studies Requirements ............................ 39-40 SEM. HRS.
Free Electives .............................................. 9-10 SEM. HRS.

• Computer Science Curriculum ............................ 71 SEM. HRS.

COMP 1100 INTRODUCTION TO COMPUTING .................. 3
COMP 1102 PRINCIPLES OF PROGRAMMING I .................. 3
COMP 1108 PRINCIPLES OF PROGRAMMING II .................. 3
COMP 2200 OBJECT-ORIENTED PROGRAMMING ................ 3

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<td>COMP 2220</td>
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<td>COMP 2230</td>
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<td>COMP 2270</td>
<td>DATA STRUCTURES</td>
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<td>COMP 3340</td>
<td>OPERATING SYSTEMS</td>
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<td>COMP 3380</td>
<td>CRYPTOGRAPHY IN COMPUTER SECURITY</td>
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<td>COMP 3395</td>
<td>ETHICAL ISSUES IN COMPUTING</td>
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<td>COMP 4410</td>
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<td>COMP 4415</td>
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<td>COMP 4495</td>
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<td>BISM 2600</td>
<td>INTRODUCTION TO NETWORKING ADMINISTRATION</td>
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<td>CALCULUS I</td>
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<td>MATH 2216</td>
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• General Studies Requirements .......... 39-40 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 1108 Written English II .................................. 3

Attribute IB – Quantitative Literacy
MATH 1190 Calculus I ........................................... X

Attribute IC – Written Communication
ENGL 1104 Written English ...................................... 3

Attribute ID – Teamwork
Met in IG with COMP 2200 ........................................ X

Attribute IF – Technology Literacy
TECH 1100 Technology and Society OR Choice ................. 3

Attribute IV – Oral Communication
COMM 2200 Introduction to Human Communication .......... 3

Attribute II – Citizenship
Any course .................................................................. 3

Attribute IA – Critical Analysis
ENGL 1108 Written English II .................................. 3

Attribute IB – Quantitative Literacy
MATH 1190 Calculus I ........................................... X

Attribute IC – Written Communication
ENGL 1104 Written English ...................................... 3

Attribute ID – Teamwork
Met in IG with COMP 2200 ........................................ X

Attribute IF – Technology Literacy
TECH 1100 Technology and Society OR Choice ................. 3

Attribute IV – Oral Communication
COMM 2200 Introduction to Human Communication .......... 3

Attribute III – Citizenship
Any course .................................................................. 3

Attribute IV – Ethics
Any course .................................................................. 3

Attribute V – Health
PHED 1100 Fitness and Wellness OR Choice .................... 2-3

Attribute VI – Interdisciplinary
Any course .................................................................. 3

Attribute VIIA – Fine Arts
Any course .................................................................. 3

Attribute VIII – Humanities
Any course .................................................................. 3

Attribute VIIIC – Social Science
Any course .................................................................. 3

Attribute VIIID – Natural Science
Any course except PHYS courses .................................. 4-5

Attribute VIIIA – Cultural Awareness
Any course .................................................................. 3

MINOR IN COMPUTER SCIENCE ............... 18 SEM. HRS.

Required Courses (9 hrs.)
COMP 1102 PRINCIPLES OF PROGRAMMING I ............... 3
COMP 1108 PRINCIPLES OF PROGRAMMING II ............... 3
COMP 2200 OBJECT-ORIENTED PROGRAMMING ............... 3

Electives (9 hrs)
COMP 2201 MACHINE ORGANIZATION .......................... 3
COMP 2220 FUNDAMENTALS OF COMPUTER SECURITY ....... 3
COMP 2230 NETWORK PROGRAMMING ........................... 3
COMP 2270 DATA STRUCTURES .................................. 3
COMP 3300 COMPUTER GRAPHICS .............................. 3
COMP 3395 ETHICAL ISSUES IN COMPUTING ............... 3
COMP 4440 SOFTWARE ENGINEERING ......................... 4
MATH 2216 INTRODUCTION TO DISCRETE MATHEMATICS ... 3

MATHEMATICS

The mission of the mathematics degree programs is to equip students with analytic and problem-solving skills for careers or graduate study.

Classes develop a student’s ability to apply mathematical methods and ideas to problems in mathematics and other fields.

Students learn to communicate ideas effectively, assimilate new information, and to be self-reliant learners.

The department cooperates fully with the School of Education in meeting its mission for candidates for an A.B. degree in education with mathematics teaching specialization for either the 5-9 or the 5-Adult grade levels.

Students interested in mathematics have the option of selecting one of the following degree programs:

1) the Bachelor of Science degree in Mathematics, as preparation for immediate employment or for graduate school.

2) the Bachelor of Arts in Education degree with a 5-Adult comprehensive specialization as preparation for teaching mathematics. Students receiving a B.A. in Math Education also satisfy the degree requirements for a B.S. in Mathematics. Students pursuing these degrees are advised in the Math department. NOTE: MATH 1113, 1125, 1190, 3315, 3316, and 2212 are required for both degrees and should be completed early in the program.

3) the Mathematics 5-9 teaching specialization can be added to an Elementary Education degree or as a second specialization with a B.A. in Education.

It is expected that incoming students in this field will present a minimum of four units of high school mathematics, including the equivalent of two units of algebra, one unit of geometry, and one advanced unit such as Pre-Calculus. Students without this background may be required to complete appropriate lower-level courses in addition to the stated requirements. Students should consult with their advisor concerning credit for prerequisites and special examinations for course credit. All students majoring in mathematics must complete a minor. Students who are receiving a teaching certificate use Education as their minor.

BACHELOR OF SCIENCE
IN MATHEMATICS ............................................. 120 SEM. HRS.
Mathematics Curriculum (see below) .......... 45 SEM. HRS. *
Minor (Required) ............................................. 18-24 SEM. HRS.
General Studies Requirements ................. 30-32 SEM. HRS. *
(See “Degree Requirements” for General Studies requirements not completed through the major)
Free Electives ................................................... 19-27 SEM. HRS. *

*Choosing higher-credit hour alternatives in the mathematics curriculum reduces the minimum number of free elective credit hours required to reach 120 semester hours.

• Mathematics Curriculum ............................... 45 SEM. HRS.

Required Courses (36 hrs.)
MATH 1113 APPLIED STATISTICS ......... 3
MATH 1125 MATH REASONING: READING AND WRITING .... 3
MATH 1190 CALCULUS I ................................................. 4
MATH 2200 MATHEMATICAL LOGIC ........................................ 3
MATH 2212 SETS, RELATIONS AND FUNCTIONS ................. 3
MATH 3315 CALCULUS II ................................................. 4
MATH 3316 CALCULUS III ............................................... 4
MATH 3335 PROBABILITY AND STATISTICS ................. 3
MATH 3361 ABSTRACT ALGEBRA ....................................... 3
MATH 3362 LINEAR ALGEBRA ........................................... 3
COMP 1102 PRINCIPLES OF PROGRAMMING I ....................... 3

Any one of the following science courses:
(The course hours from this section are counted in General Studies)

CHEM 1101 GENERAL CHEMISTRY I .................................. (4)
CHEM 1105 CHEMICAL PRINCIPLES .................................. (5)
PHYS 1101 INTRODUCTION TO PHYSICS I ....................... (4)
PHYS 1105 PRINCIPLES OF PHYSICS I ............................ (5)

Math Electives (9 hrs)
(Choose three courses from Groups A and B. At least one course must be chosen from Group A.)

GROUP A:
MATH 3375 TOPOLOGY .................................................... 3
MATH 3391 REAL ANALYSIS ............................................. 3

GROUP B:
MATH 2206 INTRODUCTION TO THE THEORY OF NUMBERS ...... 3
MATH 2216 INTRODUCTION TO DISCRETE MATHEMATICS .... 3
MATH 3342 NUMERICAL ANALYSIS .................................. 3
MATH 3372 MODERN GEOMETRY .................................... 3
MATH 4401 DIFFERENTIAL EQUATIONS ............................. 3

MINOR Field of Study (REQUIRED) .................. 18-24 credits

• General Studies Requirements .......... 30-32 SEM. HRS.
(When choices are available, see the full General Studies Curriculum in Appendix A.)

Attribute IA – Critical Analysis:
ENGL 1108* or any course listed in IA .......................... 3

Attribute IB – Quantitative Literacy:
MATH 1107 or higher in 1B choices. (Satisfied in Major) ...... X

Attribute IC – Written Communication:
ENGL 1104* or any course listed in IC ......................... 3

Attribute ID – Teamwork:
COMM 2200* or any course listed in ID .......................... 3

Attribute IE – Information Literacy:
ENGL 1108* (Satisfied in Attribute IA) or any course listed in IE ... 3

Attribute IF – Technology Literacy:
Any course in IF ......................................................... 3

Attribute IG – Oral Communication:
COMM 2200* (Satisfied in Attribute ID), or any course in IG .......... X

Attribute II – Citizenship:
POLI 1103* or any course in III ..................................... 3

Attribute IV – Ethics:
ENGL 2200* or any course in IV ..................................... 3

Attribute V – Health:
PHED 1100* or any course in V ..................................... 2-3

Attribute VI – Interdisciplinary:
POLI 1103* (Satisfied in Attribute III) or any course in VI .......... X

Attribute VIIA – Arts:
Any course listed in VIIA .............................................. 3

Attribute VIIIB – Humanities:
ENGL 2220* (Satisfied in Attribute IV) or any course listed in VIIB .... X

Attribute VIIIC – Social Sciences:
GEOG 2210* or any course in VIIC ................................ 3

Attribute VIIID – Natural Science:
PHYS 1101, PHYS 1105, CHEM 1101, OR CHEM 1105 ............ 4-5

Attribute VIIIE – Cultural Awareness:
GEOG 2210* (Satisfied in VIIIC) or any course in VIII .......... X

*Starred courses are recommended choices. Choosing a different course may result in more than 120 hours need to graduate.

MINOR IN MATHEMATICS .................. 24 SEM. HRS.

Required Courses (12 hrs.)
MATH 1190 CALCULUS I ................................................. 4
MATH 3315 CALCULUS II ............................................... 4
MATH 3316 CALCULUS III ............................................... 4

Electives (12 hrs.)
(Choose four courses from the following list with at most one 1000 level course and at least one 3000/4000 course).

MATH 1113 APPLIED STATISTICS .................................... 3
MATH 1125 MATH REASONING: READING AND WRITING .... 3
MATH 2200 MATHEMATICAL LOGIC .................................. 3
MATH 2206 INTRODUCTION TO THE THEORY OF NUMBERS .... 3
MATH 2212 SETS, RELATIONS AND FUNCTIONS ................. 3
MATH 2216 INTRODUCTION TO DISCRETE MATHEMATICS .... 3
MATH 3335 PROBABILITY AND STATISTICS .................. 3
MATH 3342 NUMERICAL ANALYSIS ................................ 3
MATH 3361 ABSTRACT ALGEBRA .................................... 3
MATH 3362 LINEAR ALGEBRA ........................................... 3
MATH 3372 MODERN GEOMETRY .................................... 3
MATH 3375 TOPOLOGY ................................................... 3
MATH 3391 REAL ANALYSIS ............................................. 3
MATH 4401 DIFFERENTIAL EQUATIONS ............................. 3

BACHELOR OF ARTS IN EDUCATION:
SPECIALIZATION IN MATHEMATICS

GRADUES 5-ADULT ........................................... 120 SEM. HRS.
Mathematics Curriculum (see below) ........................... 48 SEM. HRS.*
General Studies Requirements .................. 30-32 SEM. HRS.
(See “Degree Requirements” for General Studies requirements not completed through the major)
Professional Education Courses ................. 39 SEM. HRS.
Free Electives .......................... 1-3 SEM. HRS.

*Choosing higher-credit hour alternatives in the mathematics curriculum reduces the minimum number of free elective credit hours required to reach 120 semester hours.

• Mathematics Curriculum .................. 48 SEM. HRS.

Required Courses (45 hrs.)
MATH 1113 APPLIED STATISTICS .................................... 3
MATH 1125 MATH REASONING: READING AND WRITING .......... 3
MATH 1190 CALCULUS I ............................................... 4
MATH 2200 MATHEMATICAL LOGIC .................................. 3
MATH 2212 SETS, RELATIONS AND FUNCTIONS ................. 3
MATH 2216 INTRODUCTION TO DISCRETE MATHEMATICS .... 3
MATH 3315 CALCULUS II ............................................... 4
MATH 3316 CALCULUS III ............................................... 4
MATH 3335 PROBABILITY AND STATISTICS .................. 3
MATH 3361 ABSTRACT ALGEBRA .................................... 3
MATH 3362 LINEAR ALGEBRA ........................................... 3
MATH 3372  MODERN GEOMETRY ........................................3
MATH 4431  METHODS & MATERIALS OF TEACHING MATH........3
COMP 1102  PRIN. OF PROGRAMMING I ..........................3

Any one of the following science courses:

CHEM 1101  GENERAL CHEMISTRY I ..........................4
CHEM 1105  CHEMICAL PRINCIPLES .........................5
PHYS 1101  INTRODUCTION TO PHYSICS I ..................4
PHYS 1105  PRINCIPLES OF PHYSICS I ....................5

Electives (3 hrs.)
(Choose one of the following.)

MATH 3375  TOPOLOGY .............................................3
MATH 3391  REAL ANALYSIS ......................................3

*All courses must be completed prior to admission to Secondary Student Teaching/Clinical III.

• Professional Education ................................. 39 SEM. HRS.

EDUC 2200  INTRO TO EDUCATION ..........................3
EDUC 2201  INSTRUCTIONAL TECHNOLOGY ................3
EDUC 2203  HUMAN DEVELOPMENT, LEARNING & TEACHING 3
EDUC 2240  HIGH IncIDENCE DISABILITIES FOR EDUCATORS 3
EDUC 2260  INSTRUCTIONAL DESIGN I .......................3
EDUC 2265  FIELD EXPERIENCE 2 ..............................1
EDUC 3331  READING IN THE CONTENT AREAS ...........3
EDUC 3340  INSTRUCTIONAL DESIGN II ....................3
EDUC 3351  INCLUSIVE CLASSROOM PRACTICES ..........3
EDUC 3365  FIELD EXPERIENCE 3 ............................2
EDUC 4485  ACTION RESEARCH ................................1
EDUC 4486  PORTFOLIO ...........................................1
EDUC 4496  SECONDARY STUDENT TEACHING ...........10

• General Studies Requirements ................. 30-32 SEM. HRS.
(When choices are available, see the full General Studies Curriculum in Appendix A.)

Attribute IA – Critical Analysis:
ENGL 1108* or any course listed in IA ........................3

Attribute IB – Quantitative Literacy:
MATH 1107 or higher in IB choices. (Satisfied in Major) X

Attribute IC – Written Communication:
ENGL 1104* or any course listed in IC .......................3

Attribute ID – Teamwork:
COMM 2200* or any course listed in ID ....................3

Attribute IE – Information Literacy:
ENGL 1108* (Satisfied in Attribute IA) or any course listed in IE ........3

Attribute IF – Technology Literacy:
Any course in IF ..................................................3

Attribute IG – Oral Communication:
COMM 2200* (Satisfied in Attribute ID). or any course in IG ..........X

Attribute III – Citizenship:
POLI 1103* or any course in III ..............................3

Attribute IV – Ethics:
ENGL 2220* or any course in IV .............................3

Attribute V – Health:
PHED 1100* or any course in V ..............................2-3

Attribute VI – Interdisciplinary:
POLI 1103* (Satisfied in Attribute III) or any course in III X

Attribute VIIA – Arts:
Any course listed in VIIA .........................................X

Attribute VIIB – Humanities:
ENGL 2220* (Satisfied in Attribute IV) or any course listed in VIIB X

Attribute VIIC – Social Sciences:
GEOG 2210* or any course in VIIC ..........................3

Attribute VIID – Natural Science:
PHYS 1101, PHYS 1105, CHEM 1101, or CHEM 1105 ..........4-5

Attribute VIII – Cultural Awareness:
GEOG 2210* (Satisfied in VIIIC) or any course in VIIIIG X Additional General Studies Hours:
MATH 3361 (Satisfied in Major) ..................................X

*Starred courses are recommended choices. Choosing a different course may result in more than 120 hours need to graduate.

MATHEMATICS TEACHING SPECIALIZATION, GRADES 5-9 ..........29 SEM. HRS.
This specialization prepares teacher candidates for general mathematics through Algebra I.

Required courses (31 hrs.)

MATH 1112  COLLEGE ALGEBRA* ......................3
MATH 1113  APPLIED STATISTICS .........................3
MATH 1115  TRIG. AND ELEMENTARY FUNCTIONS ..........3
MATH 1125  MATH REASONING: READING AND WRITING 3
MATH 1185  APPLIED CALCULUS I ..........................4
MATH 2216  INTRODUCTION TO DISCRETE MATHEMATICS 3
MATH 2251  STRUCTURE OF THE REAL NUMBERS ..........4
MATH 2252  DATA ANALYSIS AND GEOMETRY ............3
MATH 3353  MATH METHODS FOR ELEMENTARY TEACHERS 3
MATH 4431  METHODS & MATERIALS OF TEACHING MATH 3

PHYSICS
(MINOR ONLY)

The physics program provides students in science, mathematics, technology, secondary education and various pre-professional programs with an understanding of fundamental concepts and principles that govern the physical universe. Physics students utilize mathematical methods, observation and critical reasoning to describe and analyze relationships between properties of matter and the interactions that cause things to change. The physics program’s goal is to provide an environment for the development and application of analytic and problem-solving skills needed for careers and graduate study. Students may earn a minor in physics that complements majors in science, math, computer science and technology. A physics single specialization for grades 9-adult (see below) and a general science specialization (see Department of Biology, Chemistry and Geoscience) for grades 5-adult are also offered for the B.A. in Education degree, in conjunction with the School of Education. The Physics single specialization is a mostly on-line set of courses, making the program easier for nontraditional students or for professionals who need to add a physics specialization.

MINOR IN PHYSICS ................................. 30 SEM. HRS.

Required courses (30 hrs.)

PHYS* 1101/02  INTRODUCTION TO PHYSICS I, II ............8
PHYS 3310  ELECTRICITY AND ELECTRONICS ..............4
PHYS 3325  ADVANCED PHYSICS I ............................4
PHYS 3335  ADVANCED PHYSICS II ............................4
PHYS 3340  SPECIAL PROBLEMS ............................4
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

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

BACHELOR OF ARTS IN EDUCATION:
SPECIALIZATION IN PHYSICS
GRADES 9-ADULT ............................................120 SEM. HRS.
Physics Curriculum (see below)* ..................45-48 SEM. HRS.
General Studies Requirements .......................30 SEM. HRS.
(See “Degree Requirements” for General Studies
requirements not completed through the major).
Professional Education Courses .................39 SEM. HRS.
Free Electives* ......................................3-6 SEM. HRS.

*Choosing higher-credit hour alternatives in the physics
curriculum reduces the minimum number of free elective
credit hours required to reach 120 semester hours.

• Physics Curriculum .................................45-48 SEM. HRS.

Required courses (45-48 hrs.)
(the above number includes courses included as directed
General Studies courses)

BIOL 1105 PRINCIPLES OF BIOLOGY I .................4
CHEM 1105/2200 CHEMICAL PRINCIPLES/ FOUND. BIOCHEMISTRY  9
        -OR-
CHEM 1101/1102 GENERAL CHEMISTRY I, II .............8
MATH 3315 CALCULUS II ................................4
        -OR-
MATH 1186 APPLIED CALCULUS II
        -OR-
TECH 3300 ENGINEERING ANALYSIS
PHSC 4430 SCIENCE INTEGRATION SEMINAR ...........1
PHSC 4431 METHODS & MATERIALS IN TEACHING SCIENCE  3
PHYS 1101/1102 INTRODUCTION TO PHYSICS I, II ........8
        -OR-
PHYS 1105/1106 PRINCIPLES OF PHYSICS I, II ........10
PHYS 2202 ASTRONOMY ..................................3
PHYS 3211/3212 INTERMEDIATE PHYSICS IA, IB ..........6
PHYS 3221/3222 INTERMEDIATE PHYSICS II, IIB ..........6
PHYS 3230 INTERMEDIATE PHYSICS LABORATORY ........2

NOTE: Additional required science and math courses are
included as directed General Studies credits. These include an
additional 4-sem.hrs of math and 8-sm.hrs. of chemistry

All courses must be completed prior to admission to Secondary
Student Teaching/Clinical III. Chemistry 1105/06 is strongly
recommended in place of 1101/02, but not required.

• Professional Education .........................39 SEM. HRS.

EDUC 2200 INTRO TO EDUCATION .....................3
EDUC 2201 INSTRUCTIONAL TECHNOLOGY ...........3
EDUC 2203 HUMAN DEVELOPMENT, LEARNING & TEACHING ......3
EDUC 2240 HIGH INCIDENCE DISABILITIES FOR EDUCATORS ....3
EDUC 2260 INSTRUCTIONAL DESIGN II ..................3
EDUC 2265 FIELD EXPERIENCE 2 .......................1
EDUC 3331 READING IN THE CONTENT AREAS ..........3
EDUC 3340 INSTRUCTIONAL DESIGN II .................3
EDUC 3351 INCLUSIVE CLASSROOM PRACTICES ..........3
EDUC 3365 FIELD EXPERIENCE 3 .......................2
EDUC 4485 ACTION RESEARCH ..............................1
EDUC 4486 PORTFOLIO ....................................1
EDUC 4496 SECONDARY STUDENT TEACHING ...........10

• General Studies Requirements ..............30 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 1108 (required) ........................................3
Attribute IB – Quantitative Literacy
MATH 1185 or 1190 ...........................................4
Attribute IC – Written Communication
MATH 1104 (required) ........................................3
Attribute ID – Teamwork
COMM 2200 or any other course in ID .................3
Attribute IE – Information Literacy
ENG 1108 or any other course in IE ....................X
Attribute IF – Technology Literacy
EDUC 2201 ....................................................X
Attribute IG – Oral Communication
COMM 2200 or any other course in IG .................X
Attribute II – Citizenship
POLI 1103 or any other course in III ...................3
Attribute IV – Ethics
ENG 2220 or any other course in IV .................3
Attribute V – Health
any course in V ........................................2
Attribute VI – Interdisciplinary
POLI 1103 ...................................................X
Attribute VIIA – Arts
Any course or combination of courses in VIIA ........3
Attribute VIIIB – Humanities
ENG 2220 or any other course in VIIIB .............X
Attribute VIIIC – Social Sciences
GEOG 2210 or any other course in VIIIC ............3
Attribute VIIID – Natural Science
CHEM 1101 or CHEM 1105 (SATISFIED IN MAJOR) ....X
Attribute VIII – Cultural Awareness
any course in VIII ....................................3
Additional General Studies hours
EDUC 3331, EDUC 3351 (SATISFIED IN MAJOR) ........X
(WRITING INTENSIVE COURSES)

Department of Technology
Hugh Costello, Chair

FACULTY

Assistant Professor of Mechanical Engineering Technology

Professor of Architecture/Civil Engineering Technology

COSTELLO, HUGH M., P.E. (2009)
Associate Professor of Mechanical Engineering Technology
This option prepares the student for employment in administrative areas with companies in and related to the aviation industry. Typical positions include airport manager, flight dispatcher, flight scheduler, crew coordinator, air cargo administration, aviation marketing, air traffic controller, and online management. A Flight Option is available within this degree; see details below.

- **Aviation Administration Curriculum**........... 33 SEM. HRS.

<table>
<thead>
<tr>
<th>Required Courses (39 hrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSBA 2201 PRINCIPLES OF ACCOUNTING..........................3</td>
</tr>
<tr>
<td>AVMA 1100 AIRCRAFT FLIGHT THEORY................................3</td>
</tr>
<tr>
<td>AVMA 1102 INTRODUCTION TO AIR TRAFFIC CONTROL ............3</td>
</tr>
<tr>
<td>AVMA 2206 AVIATION SECURITY ......................................3</td>
</tr>
<tr>
<td>AVMA 2210 AVIATION METEOROLOGY ................................3</td>
</tr>
<tr>
<td>AVMA 2211 AIRPORT MANAGEMENT ..................................3</td>
</tr>
<tr>
<td>AVMA 2213 AIRPORT PLANNING AND DEVELOPMENT ...............3</td>
</tr>
<tr>
<td>BSBA 3310 BUSINESS STATISTICS ....................................3</td>
</tr>
<tr>
<td>BSBA 2204 PRINCIPLES OF MARKETING ..............................3</td>
</tr>
<tr>
<td>SFTY 1100 SAFETY &amp; ENVIRONMENTAL COMP. OF INDUSTRY .......3</td>
</tr>
<tr>
<td>SFTY 1150 SAFETY MGT. &amp; CONCEPTS IN ACCIDENT PREV. ........3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Electives (Select 6hrs. from the following courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVMA 4401 AVIATION INDUSTRY RESEARCH ....................3</td>
</tr>
<tr>
<td>AVMA 4403 AVIATION PROJECT ....................................1-4</td>
</tr>
<tr>
<td>AVMA 4411 AVIATION INDUSTRY INTERNSHIP ....................3</td>
</tr>
<tr>
<td>AVMA 4498 UNDERGRADUATE RESEARCH ..........................1-6</td>
</tr>
</tbody>
</table>

- **General Studies Requirements**........... 39-41 SEM. HRS.

<table>
<thead>
<tr>
<th>Attribute IA – Critical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1108 .................................3</td>
</tr>
<tr>
<td>Attribute IB – Quantitative Literacy</td>
</tr>
<tr>
<td>MATH 1102 or 1112 .......................3</td>
</tr>
<tr>
<td>Attribute IC – Written Communication</td>
</tr>
<tr>
<td>ENGL 1104 ................................3</td>
</tr>
<tr>
<td>Attribute ID – Teamwork</td>
</tr>
<tr>
<td>MANF 2250 ................................3</td>
</tr>
<tr>
<td>Attribute IE – Information Literacy</td>
</tr>
<tr>
<td>Met in Attribute IA with ENGL 1108 ..........X</td>
</tr>
<tr>
<td>Attribute IF – Technology Literacy</td>
</tr>
<tr>
<td>TECH 1100 or BISM 1200 or ENGL 1109 ..........3</td>
</tr>
<tr>
<td>Attribute IG – Oral Communication</td>
</tr>
<tr>
<td>COMM 2200 or 2201 or 2202 ................3</td>
</tr>
<tr>
<td>Attribute IIIC – Citizenship</td>
</tr>
<tr>
<td>POLI 1103 ................................3</td>
</tr>
<tr>
<td>Attribute IV – Ethics</td>
</tr>
<tr>
<td>Met in Attribute IG with COMM 2200 or 2201 or 2202 ..........3</td>
</tr>
<tr>
<td>Attribute V – Health</td>
</tr>
<tr>
<td>Any course listed in V ..........................2-3</td>
</tr>
<tr>
<td>Attribute VI – Interdisciplinary</td>
</tr>
<tr>
<td>Met in Attribute III with POLI 1103 ..........X</td>
</tr>
<tr>
<td>Attribute VIIA – Arts</td>
</tr>
<tr>
<td>Any course listed in VIIA ........................3</td>
</tr>
<tr>
<td>Attribute VIIIB – Humanities</td>
</tr>
<tr>
<td>Any course listed in VIIIB ........................3</td>
</tr>
<tr>
<td>Attribute VIIIC – Social Sciences</td>
</tr>
<tr>
<td>BSBA 2200 or 2201 or PSYC 1101 or SOCY 1110 ..........3</td>
</tr>
<tr>
<td>Attribute VIIID – Natural Science</td>
</tr>
<tr>
<td>PHYS 1101 or 1105 ..........................4-5</td>
</tr>
<tr>
<td>Attribute VIII – Cultural Awareness</td>
</tr>
<tr>
<td>Any course listed in VIII ........................3</td>
</tr>
<tr>
<td>Additional General Studies hours ....................0</td>
</tr>
</tbody>
</table>

**AVIATION TECHNOLOGY**

The Bachelor of Science in Aviation Technology is offered to students whose career objective is the management and operation of airside activities in the aviation industry. The program provides the graduate with technical competence in an aviation-related career as well as the skills needed to assume supervisory responsibilities. There are several areas of specialization in this degree: Aviation Administration (which has a focus on management), Aviation Administration with a Flight option, and Aviation Maintenance Management. All Aviation Technology students are required to take the Aviation Common Core requirements listed below.

- **Aviation Common Core** .....................27 SEM. HRS.

| AVMA 3301 AVIATION HISTORY ......................3 |
| AVMA 3302 AVIATION LAW ........................3 |
| AVMA 3303 AIRLINE OPERATIONS ..................3 |
| AVMA 3304 AVIATION MAINTENANCE MANAGEMENT ..3 |
| AVMA 3305 GENERAL AVIATION OPERATIONS .......3 |
| AVMA 3307 AVIATION SAFETY ........................3 |
| AVMA 4402 FISCAL ASPECTS OF AVIATION MANAGEMENT ........3 |
| BSBA 2209 PRINCIPLES OF MANAGEMENT ..........3 |
| MGMT 3390 ORGANIZATIONAL BEHAVIOR ..........3 |

**AVIATION ADMINISTRATION** ..............120 SEM. HRS.

Aviation Common Core .....................27 SEM. HRS.

Aviation Admin. Curriculum (see below) ....39 SEM. HRS.

General Studies Requirements ............39-41 SEM. HRS.

Free Electives ............................13-15 SEM. HRS.

**CRIHALMEANU, MUSAL (2015)**
Temporary Assistant Professor of Electronics Engineering Technology

**DRESCHER, WILLIAM (2015)**
Temporary Associate Professor of Graphics Technology

**FREEMAN, PHILIP M. AIA (2003)**
Associate Professor of Architecture

**GILBERTI, ANTHONY F., DTE (2007)**
Professor of Technology Education
Graduate Faculty

Professor of Architecture

**VASSIL, JAMES E., P.E. (2002)**
Associate Professor of Civil Engineering Technology

**VOSBURGH, JASON (2015)**
Temporary Assistant Professor of Aviation Technology

**WOLF, MARK (2011)**
Temporary Assistant Professor of Technology Education

**ZICKEFOOSE, GARY, P.E. (1984)**
Associate Professor of Civil Engineering Technology

**Associate Professor of Civil Engineering Technology**

**Professor of Technology Education**

**Temporary Assistant Professor of Technology Education**

**Temporary Assistant Professor of Aviation Technology**

**Associate Professor of Aviation Technology**

**Fairmont State University**
AVIATION ADMINISTRATION / PROFESSIONAL FLIGHT 120 SEM. HRS.
Aviation Common Core 27 SEM. HRS.
Aviation Admin./Flight Curriculum 48 SEM. HRS.
General Studies Requirements 39-41 SEM. HRS.
Free Electives 4-6 SEM. HRS.

Flight fees for students to obtain their private, commercial, or instrument license must be paid during the semester in which you enroll in the class.

- Aviation Administration / Flight Curriculum 45 SEM. HRS.

Required Courses (48 hrs.)
BSBA 2201 PRINCIPLES OF ACCOUNTING 3
AVMA 1101 PRIVATE PILOT TECHNOLOGY 3
AVMA 1102 INTRO TO AIR TRAFFIC CONTROL 3
AVMA 1103 PRIVATE PILOT FLIGHT LAB 3
AVMA 2201 INSTRUMENT PILOT RATING 3
AVMA 2204 INSTRUMENT PILOT FLIGHT LAB 3
AVMA 2205 AVIATION SECURITY 3
AVMA 2211 AIRPORT MANAGEMENT 3
AVMA 2213 AIRPORT PLANNING & DEVELOPMENT 3
AVMA 3300 COMMERCIAL PILOT TECHNOLOGY 3
AVMA 3306 COMMERCIAL PILOT FLIGHT LAB 3
BSBA 3310 BUSINESS & ECONOMICS STATISTICS 3
BSBA 2204 PRINCIPLES OF MARKETING 3
SFTY 1100 SAFETY & ENVIRONMENTAL COMPONENTS OF INDUSTRY 3
SFTY 1150 SAFETY MANAGEMENT & CONCEPTS IN ACCIDENT PREVENTION 3

Major Electives (Select 3 credits from the following)
AVMA 4401 AVIATION INDUSTRY RESEARCH AND ANALYSIS 3
AVMA 4403 AVIATION PROJECT 3
AVMA 4411 AVIATION INDUSTRY INTERNSHIP 3
AVMA 4498 UNDERGRADUATE RESEARCH 3

- General Studies Requirements 39-41 SEM. HRS.

Attribute IA – Critical Analysis
ENGL 1108 3
Attribute IB – Quantitative Literacy
MATH 1102 or 1112 3
Attribute IC – Written Communication
ENGL 1104 3
Attribute ID – Teamwork
MANF 2250 3
Attribute IE – Information Literacy
Met in Attribute IA with ENGL 1108 X
Attribute IF – Technology Literacy
TECH 1100 or BISM 1200 or ENGL 1109 3
Attribute IG – Oral Communication
COMM 2200 or 2201 or 2202 3
Attribute II – Citizenship
POLI 1103 3
Attribute IV – Ethics
Met in Attribute IG with COMM 2200 or 2201 or 2202 3
Attribute V – Health
Any course listed in V 2-3
Attribute VI – Interdisciplinary
Met in Attribute III with POLI 1103 X
Attribute VIIA – Arts
Any course listed in VIIA 3
Attribute VIIIB – Humanities
Any course listed in VIIIB 3
Attribute VIIIC – Social Sciences
BSBA 2200 or 2201 or PSYC 1101 or SOCY 1110 3

Attribute VIIC – Social Sciences
BSBA 2200 or 2201 or PSYC 1101 or SOCY 1110 3
Attribute VIIB – Humanities
BSBA 2200 or 2201 or PSYC 1101 or SOCY 1110 3
Attribute VIID – Natural Science
PHYS 1101 or 1105 4-5
Attribute VIII – Cultural Awareness
Any course listed in VIII 3
Additional General Studies hours 0

MINOR IN AVIATION ADMINISTRATION (No Flight) 21 SEM. HRS.

Required Courses (15 hrs.)
AVMA 1100 AIRCRAFT FLIGHT THEORY 3
AVMA 1102 INTRODUCTION TO AIR TRAFFIC CONTROL 3
AVMA 2211 AIRPORT MANAGEMENT 3
AVMA 3303 AIRLINE OPERATIONS 3
AVMA 3305 GENERAL AVIATION OPERATIONS 3

Electives (6 hrs.)
(Select two courses from the following list.)
AVMA 2213 AIRPORT PLANNING AND DEVELOPMENT 3
AVMA 3301 AVIATION HISTORY 3
AVMA 3302 AVIATION LAW 3
AVMA 3303 AIRLINE OPERATIONS 3
AVMA 3305 GENERAL AVIATION OPERATIONS 3
AVMA 4401 AVIATION INDUSTRY RESEARCH & ANALYSIS 3

MINOR IN AVIATION ADMINISTRATION (Flight Option) 18 SEM. HRS.

Required Courses (12 hrs.)
AVMA 1101 PRIVATE PILOT TECHNOLOGY 3
AVMA 3301 AVIATION HISTORY 3
AVMA 3302 AVIATION LAW 3
AVMA 3305 GENERAL AVIATION OPERATIONS 3

Electives (6 hrs.)
(Select two courses from the following list.)
AVMA 2211 AIRPORT MANAGEMENT 3
AVMA 2213 AIRPORT PLANNING AND DEVELOPMENT 3
AVMA 2214 ADVANCED AIR TRAFFIC CONTROL 3
AVMA 3303 AIRLINE OPERATIONS 3
AVMA 3307 AVIATION SAFETY 3

AVIATION MAINTENANCE MANAGEMENT 120 SEM. HRS.
Aviation Common Core 27 SEM. HRS.
Aviation Maintenance Management Curriculum (see below) 53 SEM. HRS.
General Studies Requirements 39-40 SEM. HRS.
Free Electives 0-1 SEM. HRS.

This option prepares the student for entry-level management positions in the maintenance field with airlines, aviation manufacturers, repair stations, and fixed base operators. All graduates must have obtained their FAA Airframe and Powerplant License. This program is approved by the Federal Aviation Administration and meets the requirements of Federal Aviation Regulation 147.
management curriculum in a design/drafting office. Graduates with the associate degree in architectural drafting and communication skills required in order to work in a design/drafting office. Successful completion of the degree will prepare students to enter the profession at a more advanced level or pursue a graduate degree from an NAAB-accredited school of architecture. Graduates with the baccalaureate degree are qualified for entry-level positions such as designer or architectural technician. They may be employed in architectural offices, engineering offices, corporations or businesses which produce their own in-house construction documents, and construction-related fields.


engineering technology

students working toward the bachelor of science in engineering technology will be primarily concerned with the practical applications of established scientific and engineering knowledge and methods. a strong background in mathematics and science is recommended for entry into this program. the curriculum, including general education courses in business, the humanities, science and math, emphasizes the relationships of the various disciplines to technological processes in industry.

applicants for the b.s. degree in architecture, civil engineering technology, electronics engineering technology, mechanical engineering technology, and occupational safety must complete the corresponding a.s. degree, or have graduated from high school with at least a 2.75 grade point average and achieved a minimum act composite score of 19 (sat 910).

pre-engineering curriculum

students planning graduate-level work in engineering should complete the following course work with a b average or better. students are advised to carefully consult the catalog of the engineering school which they plan to attend, as fairmont state university does not have an articulation agreement with any school of engineering.

architectural technology

the b.s. in architecture provides a sound basis for the pursuit of general knowledge and the first phase of a professional education for the general practice of architecture. the four-year program encompasses a foundation core of design, introductory studies in architectural history and theory, and building technology. advanced design studios address methodology, and technological and theoretical synthesis through applied studies of a wide range of design inquiries and projects. successful completion of the degree will prepare students to enter the profession at a more advanced level or pursue a graduate degree from an naab-accredited school of architecture. graduates with the baccalaureate degree are qualified for entry-level positions such as designer or architectural technician. they may be employed in architectural offices, engineering offices, corporations or businesses which produce their own in-house construction documents, and construction-related fields.

associate of science in architectural engineering technology

the associate degree in architectural engineering technology provides students with a basic understanding of the history of architectural design and the entry-level drafting and communication skills required in order to work in a design/drafting office. graduates with the associate
of science degree are qualified for entry-level technical positions in architectural or engineering offices, firms related to architecture, or other businesses requiring in-house planning and drafting.

Required Courses (32 hrs.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 1000</td>
<td>DESIGN FUNDAMENTALS I</td>
<td>4</td>
</tr>
<tr>
<td>ARCH 1050</td>
<td>DESIGN FUNDAMENTALS II</td>
<td>4</td>
</tr>
<tr>
<td>ARCH 2000</td>
<td>DESIGN I: FOUNDATION</td>
<td>4</td>
</tr>
<tr>
<td>ARCH 2010</td>
<td>ARCHITECTURAL HISTORY I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 2020</td>
<td>ARCHITECTURAL HISTORY II</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 2050</td>
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<tr>
<td>ARCH 2060</td>
<td>BUILDING TECHNOLOGY I</td>
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</tr>
<tr>
<td>MATH 1115</td>
<td>TRIGONOMETRY</td>
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<tr>
<td>MECH 1100</td>
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- General Studies Attributes (24 hrs.)

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<tr>
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<tr>
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<tr>
<td>IB – Quantitative Literacy</td>
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<tr>
<td>IC – Written Communication</td>
<td>ENGL 1104</td>
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<td>ID – Teamwork</td>
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<tr>
<td>IF – Technology Literacy</td>
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</tr>
<tr>
<td>IG – Oral Communication</td>
<td>Met in Major with ARCH 2060</td>
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<td>III – Any course listed in Attribute III</td>
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<tr>
<td>IV – Ethics</td>
<td>Any course listed in Attribute IV</td>
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</tr>
<tr>
<td>V – Health &amp; Well-being</td>
<td>PHED 1100</td>
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<td>VI – Interdisciplinary &amp; Lifelong Learning</td>
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<td>VIIA – Art Appreciation</td>
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<tr>
<td>VIIB – Humanities</td>
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<tr>
<td>VII – Social Sciences</td>
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<td>VIII – Natural Sciences</td>
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<td>4</td>
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<tr>
<td>VIII – Cultural Awareness &amp; Human Dignity</td>
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- Free Electives ........................................... 4 SEM. HRS.

BACHELOR OF SCIENCE
IN ARCHITECTURE ............................................. 126 SEM. HRS.

Architectural Curriculum (see below) ............................................. 71 SEM. HRS.
General Studies Requirements ............................................. 36 SEM. HRS.
Program Electives ......................................................... 19 SEM. HRS.

(See “Degree Requirements” for General Studies requirements not completed through the major)

The B.S. in Architecture provides a sound basis for the pursuit of general knowledge and the first phase of a professional education for the general practice of architecture. The four-year program encompasses a foundation core of design, introductory studies in architectural history and theory, and building technology. Advanced design studies address methodology, and technological and theoretical synthesis through applied studies of a wide range of design inquiries and projects. Successful completion of the degree will prepare students to enter the profession at a more advanced level or pursue a graduate degree from an NAAB-accredited school of architecture. Graduates with the baccalaureate degree are qualified for entry-level positions such as designer or engineering technician. They may be employed in architectural offices, engineering offices, corporations or businesses which produce their own in-house construction documents, and construction-related fields.

- Architecture Curriculum ............................................. 71 SEM. HRS.

Required Courses (71 hrs.)

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<thead>
<tr>
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<td>DESIGN FUNDAMENTALS II</td>
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<td>ARCH 2010</td>
<td>ARCHITECTURAL HISTORY I</td>
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<td>ARCH 2060</td>
<td>BUILDING TECHNOLOGY I</td>
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<td>TRIGONOMETRY</td>
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<td>MECH 1100</td>
<td>STATICS</td>
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- General Studies Requirements ............................................. 36 SEM. HRS.

(When choices are available, see the full General Studies Curriculum in Appendix A.)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Course</th>
<th>Credits</th>
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<tr>
<td>IA – Critical Analysis</td>
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<td>IB – Quantitative Literacy</td>
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<tr>
<td>IF – Technology Literacy</td>
<td>Met in Major with ARCH 2060</td>
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</tr>
<tr>
<td>IG – Oral Communication</td>
<td>Met in Major with ARCH 2060</td>
<td>X</td>
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<td>II – Proficiency in the Major Fulfilled by the Major requirements</td>
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<tr>
<td>III – Any course listed in Attribute III</td>
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<td>IV – Ethics</td>
<td>Any course listed in Attribute IV</td>
<td>XXXX</td>
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<tr>
<td>V – Health &amp; Well-being</td>
<td>PHED 1100</td>
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<tr>
<td>VI – Interdisciplinary &amp; Lifelong Learning</td>
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<tr>
<td>VIIA – Art Appreciation</td>
<td>ART 1120</td>
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<tr>
<td>VIIB – Humanities</td>
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<td>VII – Social Sciences</td>
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<td>VIII – Natural Sciences</td>
<td>PHYS 1101</td>
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</tr>
<tr>
<td>VIII – Cultural Awareness &amp; Human Dignity</td>
<td>XXXX</td>
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</table>

Program Electives (19 hrs.)

(Choose in consultation with advisor)
CIVIL ENGINEERING TECHNOLOGY

The Civil Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org. The Civil Engineering Technology program at Fairmont State University prepares graduates to participate in the planning, analysis, design, construction, operation and maintenance of roadways, airports, tunnels, bridges, water supply and distribution systems, waste collection and treatment systems. The curriculum is a highly flexible 2 + 2 design; once the two-year associate’s degree is earned, graduates may choose to enter the workforce or continue their education with two more years at the baccalaureate level.

ASSOCIATE OF SCIENCE IN CIVIL ENGINEERING TECHNOLOGY (ETAC of ABET Accredited) .................. 60 SEM. HRS.

The Associate of Science degree in Civil Engineering Technology provides technical courses in the fundamentals of engineering, surveying, construction materials and methods, computer graphics, civil engineering graphics, construction estimating, structures, and environmental engineering technology. Most of the technical courses provide a combination of lecture and laboratory experiences. In addition, technical courses are underpinned with instruction in mathematics and science, written and oral communication skills, and economics, which are utilized subsequently in the technical courses. Graduates with the Associate of Science degree are qualified for entry-level technical positions in construction, surveying, engineering and architectural firms; local, state and national government, environmental and public health agencies; state departments of transportation and highways; and private business industry.

Required Courses (41 hrs.)

CHM 1101 GENERAL CHEMISTRY I........................................3
CIVL 1100 INTRODUCTION TO CIVIL ENGINEERING TECHNOLOGY...........................................1
CIVL 2200 INTRODUCTION TO SURVEYING..........................3
CIVL 2210 LIGHT CONSTRUCTION..................................4
CIVL 2220 CONSTRUCTION MATERIALS AND METHODS.........................4
CIVL 2230 CONSTRUCTION ESTIMATING..................................3
CIVL 2240 LAND & & ROUTE SURVEYING..................................3
CIVL 2275 CIVIL ENGINEERING GRAPHICS..........................3
CIVL 2280 ENVIRONMENTAL ENGINEERING TECH I ..................3
CIVL 2290 INTRODUCTION TO STRUCTURES..........................3
TECH 1108 ENGINEERING GRAPHICS..................................3
MATH 1101 APPLIED TECHNICAL MATH I..........................X
MATH 1102 APPLIED TECHNICAL MATH II..........................3
MECH 1100 STATICS..................................................3
MECH 2200 STRENGTH OF MATERIALS..............................4
TECH 2290 ENGINEERING ANALYSIS I..............................4

• General Studies (19 hrs.)
Choose courses with advisor’s approval.

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY: CIVIL ENGINEERING TECHNOLOGY (ETAC of ABET Accredited) .................. 120 SEM. HRS.

Civil Engineering Technology Curriculum (see below) ............................................. 82 SEM. HRS.

General Studies Requirements ........................................................................... 33-34 SEM. HRS.
(See “Degree Requirements” for General Studies requirements not completed through the major)
Free Electives ................................................................................................. 1-2 SEM. HRS.
Technical Electives......................................................................................... 3 SEM. HRS.

The B.S.E.T. degree provides students with a greater emphasis on analysis and design with specialized classes in hydraulics and hydrology, soil mechanics and foundation design, structural analysis and design, water and wastewater systems and construction management, coupled with additional courses in science and mathematics, communication, social science and humanities.

Graduates with the Bachelor of Science degree are qualified for an entry-level position as a Civil Engineering Technologist in construction, surveying, engineering and architectural firms; local, state, and national government, environmental and public health agencies; state departments of transportation and highways; and private business industry. Baccalaureate graduates are eligible to sit for the Fundamentals of Engineering Exam (FE) in West Virginia, the first step to becoming a professional engineer.

• Civil Engineering Technology Curriculum ... 82 SEM. HRS.

Required Courses (82 hrs.)

CHM 1101 GENERAL CHEMISTRY I..............................................4
-OR-
CHM 1105 CHEMICAL PRINCIPLES ..................................4
PHYS 1101 INTRODUCTION TO PHYSICS I ..................................4
CHM 1102 GENERAL CHEMISTRY II......................................4
-OR-
CHM 2200 FOUNDATIONAL BIOCHEMISTRY..........................4
CIVL 1100 INTRODUCTION TO CIVIL ENGINEERING TECH. .......1
CIVL 2200 INTRODUCTION TO SURVEYING..........................3
CIVL 2210 LIGHT CONSTRUCTION..................................4
CIVL 2220 CONSTRUCTION MATERIALS..............................4
CIVL 2230 CONSTRUCTION ESTIMATING..............................3
CIVL 2240 LAND & ROUTE SURVEYING..............................3
CIVL 2275 CIVIL ENGINEERING GRAPHICS..........................3
CIVL 2280 ENVIRONMENTAL ENGINEERING TECH I ............3
CIVL 2290 INTRODUCTION TO STRUCTURES..........................3
CIVL 3305 HYDRAULICS AND HYDROLOGY..........................3
CIVL 3340 SOIL MECHANICS..................................................4
CIVL 4400 HIGHWAY DESIGN..................................................4
CIVL 4410 ADVANCED STRUCTURAL ANALYSIS....................3
CIVL 4420 CONSTRUCTION PLANNING & ADMIN ....................3
CIVL 4440 STRUCTURAL DESIGN.............................................3
CIVL 4460 ENVIRONMENTAL ENGINEERING TECH II ...........3
CIVL 4470 ADVANCED SOILS AND FOUNDATION....................3
TECH 1108 ENGINEERING GRAPHICS.................................3
MATH 1101 APPLIED TECHNICAL MATHEMATICS I................X
MATH 1102 APPLIED TECHNICAL MATHEMATICS II..............3
MECH 1100 STATICS..........................................................X
MECH 2200 STRENGTH OF MATERIALS..............................4
MECH 3320 DYNAMICS.......................................................3
TECH 2290 ENGINEERING ANALYSIS I..............................4
TECH 3300 ENGINEERING ANALYSIS II..............................4
Free Elective (1-2 hrs.)
Choose a course with advisor's approval.

Technical Electives (3)

- General Studies Requirements ........... 33-34 SEM. HRS.
  (When choices are available, see the full General Studies Curriculum in Appendix A.)

  Attribute IA – Critical Analysis:
  MECH 1100 (Satisfied in Major) .............................................. 3

  Attribute IB – Quantitative Literacy:
  MATH 1101 ........................................................................... 3

  Attribute IC – Written Communication:
  ENGL 1104 ........................................................................... 3

  Attribute ID – Teamwork:
  CIVL 2200 (Satisfied in Major) .............................................. X

  Attribute IE – Information Literacy:
  ENGL 1108 ........................................................................... 3

  Attribute IF – Technology Literacy:
  CIVL 2210 (Satisfied in Major) .............................................. X

  Attribute IG – Oral Communication:
  COMM 2202 ........................................................................ 3

  Attribute III – Citizenship:
  HIST 1107 or Any Course listed in III .................................. 3

  Attribute IV – Ethics:
  CIVL 4420 (Satisfed in Major) .............................................. X

  Attribute V – Health:
  Any Course in V .................................................................. 2

  Attribute VI – Interdisciplinary:
  GEOG 2210 or Any Course listed in VI ............................... 3

  Attribute VIIA – Arts:
  Any course in VIIA ................................................................ 3

  Attribute VIIB – Humanities:
  HIST 1107 or Any course listed in VIIA (Satisfied by Attribute III) ...... X

  Attribute VIIIC – Social Sciences:
  BSBA 2200 ........................................................................... 3

  Attribute VIIID – Natural Science:
  CHEM 1101 or 1105 .............................................................. 4-5

  Attribute VIIIE – Cultural Awareness:
  GEOG 2210 or Any course listed in VIIII (Satisfied by Attribute VI) .... X

ELECTRONICS ENGINEERING TECHNOLOGY

The Electronics Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org. The Electronics Engineering Technology program at Fairmont State University prepares graduates to work in industries that produce and use electrical and electronic equipment. Graduates are employed by a wide variety of industries, including coal, aerospace, semiconductor, control, utilities, glass, and computer companies. They may be involved in areas such as design, testing, maintenance, production, and supervision. The program is designed as a highly flexible 2+2 curriculum. Once the associate degree is earned, the graduate may choose to enter the workforce or continue studying at the baccalaureate level.

ASSOCIATE OF SCIENCE IN ELECTRONICS
ENGINEERING TECHNOLOGY
(ETAC of ABET Accredited) ............... 59-60 SEM. HRS.

The associate of science degree in Electronics Engineering Technology emphasizes an understanding of basic electronic circuits and devices. Students concentrate on mathematics and science, written and oral communication skills, fundamentals of electronics, and electronic specialization classes that cover transistors, linear and digital circuits, microcomputer systems, AC/DC machinery and controls, industrial systems, communication systems, and programmable logic controllers. Graduates with the associate degree are qualified for entry level technician positions in maintenance, repair, and equipment calibration.

Required Major Courses (40 hrs.)

  ELEC 1100 CIRCUIT ANALYSIS I ........................................ 3
  ELEC 2200 ELECTRONIC SHOP PRACTICES .................. 3
  ELEC 2210 CIRCUIT ANALYSIS II .................................... 3
  ELEC 2225 ELECTRONICS DEVICES ............................. 3
  ELEC 2230 DIGITAL ELECTRONICS ................................. 3
  ELEC 2240 INDUSTRIAL ELECTRONICS ......................... 3
  ELEC 2250 AC-DC MACHINERY AND CONTROLS ........... 3
  ELEC 2260 COMMUNICATION SYSTEMS ....................... 3
  ELEC 2270 MICROCOMPUTER SYSTEMS ....................... 3
  ELEC 2280 PROGRAMMABLE CONTROLLERS .................. 3
  MATH 1186 APPLIED CALCULUS II ............................... 4
  -OR-
  MATH 3315 CALCULUS II .............................................. 4
  TECH 1108 ENGINEERING GRAPHICS ....................... 3
  COMP 1101 APPLIED TECHNICAL PROGRAMMING .......... 3

  - Required General Studies Courses ...... 16-17 SEM. HRS.

  MATH 1185 APPLIED CALCULUS I ................................. 4
  ENGL 1104 WRITTEN ENGLISH I ................................. 3
  COMM 2202 INTRO. TO COMMUNICATION IN THE
  WORLD OR WORK ......................................................... 3
  PHYS 1101 INTRODUCTION TO PHYSICS ..................... 4
  HEALTH ELECTIVE ......................................................... 2
  TECH ELECTIVE ............................................................... 3

BACHELOR OF SCIENCE IN ENGINEERING
TECHNOLOGY: ELECTRONICS
ENGINEERING TECHNOLOGY
(ETAC of ABET Accredited) ............... 120 SEM. HRS.

Electronics Engineering Technology Curriculum (see below) ............. 70 SEM. HRS.
General Studies Requirements .................................. 38 SEM. HRS.
(See “Degree Requirements” for General Studies
requirements not completed through the major)
Tech Electives ......................................................... 9 SEM. HRS.
Free Electives ......................................................... 3 SEM. HRS.

The Bachelor of Science degree provides students with a greater emphasis on design and analysis, with advanced classes in linear and microcomputer systems, data acquisition and control systems, an independent senior electronics project and elective hours that can be applied to a work experience practicum in industry. Graduates with the Bachelor of Science degree are qualified for positions that range from technician through electronic engineering technologist. Work at this level usually involves product
design, writing performance requirements, developing maintenance schedules, data analysis, and programming PLC’s. Baccalaureate graduates are eligible to sit for the Fundamentals of Engineering Exam (FE) in West Virginia, the first step to becoming a professional engineer.

- Electronics Engineering Technology Curriculum.................................................. 70 SEM. HRS.

**Required Courses (70 hrs.)**

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<thead>
<tr>
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<th>Hours</th>
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<td>TECH 1108</td>
<td>ENGINEERING GRAPHICS</td>
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<td>ELEC 1100</td>
<td>CIRCUIT ANALYSIS I</td>
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<td>ELEC 2200</td>
<td>ELECTRONICS SHOP PRACTICES</td>
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<td>ELEC 2210</td>
<td>CIRCUIT ANALYSIS II</td>
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<td>ELEC 2225</td>
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<td>ELEC 2240</td>
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<td>AC-DC MACHINERY AND CONTROLS</td>
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<td>COMMUNICATIONS SYSTEMS</td>
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<td>ELEC 2270</td>
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<td>ELEC 4401</td>
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<td>DATA ACQUISITION &amp; CONTROL SYSTEMS</td>
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<td>APPLIED STATISTICS</td>
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<td>MATH 1186</td>
<td>APPLIED CALCULUS II</td>
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<td>OR-</td>
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<td>MATH 3315</td>
<td>CALCULUS II</td>
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<td>PHYS 1102</td>
<td>INTRODUCTION TO PHYSICS II</td>
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<td>SFTY 1100</td>
<td>SAFETY &amp; ENVIRONMENTAL COMP. OF INDUSTRY</td>
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**TECH Electives * (9 hrs.)**

- AVIO 2202  INSTRUMENT LANDING SYSTEMS           | 3     |
- AVIO 2204  AIRCRAFT NAVIGATION SYSTEMS          | 3     |
- AVIO 2209  AIRCRAFT PULSE AND RADAR SYSTEMS     | 3     |
- CHEM 1101  GENERAL CHEMISTRY                    | 4     |
- COMP 1102  PRINCIPLES OF PROGRAMMING I          | 3     |
- COMP 1108  PRINCIPLES OF PROGRAMMING II         | 3     |
- COMP 2200  OBJECT-ORIENTED PROGRAMMING          | 3     |
- COMP 2201  MACHINE ORGANIZATION                 | 3     |
- TECH 2208  FUNDAMENTALS OF CAD                  | 3     |
- BISM 2400  OPERATING SYSTEMS CONCEPTS           | 3     |
- BISM 2600  INTRO TO NETWORKING ADMINISTRATION   | 3     |
- MANF 2205  ENGINEERING ECONOMY                  | 3     |
- MATH 3316  CALCULUS III                         | 4     |
- MATH 3355  PROBABILITY & STATISTICS             | 3     |
- MATH 3362  LINEAR ALGEBRA                       | 3     |
- MATH 4401  DIFFERENTIAL EQUATIONS               | 3     |
- MECH 1100  STATICS                              | 3     |
- MECH 2200  STRENGTH OF MATERIALS                | 4     |
- MECH 2210  THERMODYNAMICS I                     | 3     |
- MECH 2220  FLUID MECHANICS                      | 3     |
- MECH 2240  MACHINE DESIGN I                     | 3     |
- SFTY 2250  SAFETY LAW & COMPLIANCE              | 3     |
- TECH 4401  WORK EXPERIENCE LABORATORY           | 8     |

**General Studies Requirements .................. 37-38 SEM. HRS.**

(when choices are available, see the full General Studies Curriculum in Appendix A.)

- Attribute IA-Critical Analysis:
  - ENGL 1109 .................................................. 3
- Attribute IB-Quantitative Literacy:
  - MATH 1185 or MATH 1190 .................................. 4
- Attribute IC-Written Communications:
  - ENGL 1104/1108 ............................................ 6
- Attribute ID-Teamwork:
  - MANF 2250 ................................................... X
- Attribute IE-Information Literacy:
  - ENGL 1108 .................................................. X
- Attribute IF-Technology Literacy:
  - ENGL 1109 .................................................. X
- Attribute IG-Oral Communications:
  - COMM 2202 ................................................... 3
- Attribute III-Citizenship:
  - HIST 1107 (or any approved course in this attribute) .... 3
- Attribute IV-Ethics:
  - COMM 2202 ................................................... X
- Attribute V-Health:
  - Any approved course in V .................................. 2-3
- Attribute VI-Interdisciplinary:
  - Any course in VI ............................................ 3
- Attribute VIIA-Arts:
  - Any course in VIIA ......................................... 3
- Attribute VIII-B-Humanities:
  - HIST 1107 (or any approved course in this attribute) .... X
- Attribute VIIC-Social Sciences:
  - Any Course in VIIC ......................................... 3
- Attribute VIID-Natural Science:
  - PHYS 1101 .................................................... 4
- Attribute VIII-Cultural Awareness:
  - Any Course in VIII .......................................... 3

**MINOR IN ELECTRONICS ENGINEERING TECHNOLOGY .................. 19 SEM. HRS.**

**Required Courses (19 hrs.)**

<table>
<thead>
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<td>CIRCUIT ANALYSIS II</td>
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<td>DIGITAL ELECTRONICS</td>
</tr>
<tr>
<td>ELEC 2270</td>
<td>MICROCOMPUTER SYSTEMS</td>
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<td>PHYS 1101</td>
<td>INTRODUCTION TO PHYSICS I</td>
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</tbody>
</table>

**MECHANICAL ENGINEERING TECHNOLOGY**

The Mechanical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org. Mechanical engineering technologists are concerned with the production, transmission and use of mechanical power and thermal energy. They also participate in the general design, maintenance and troubleshooting of mechanical components and assemblies (machines). The Mechanical Engineering Technology program at Fairmont State University prepares graduates for work in industry as an engineering technician or technologist where they may design, build, test, and/or maintain machines and mechanical equipment. The program is designed as a highly flexible 2 + 2 curriculum. Once the two-year degree
is earned, the graduate may choose to enter the workforce or continue to study at the baccalaureate level.

ASSOCIATE OF SCIENCE IN MECHANICAL ENGINEERING TECHNOLOGY (ETAC of ABET Accredited) ......................... 60 SEM. HRS.

The associate of science degree in Mechanical Engineering Technology emphasizes basic engineering concepts. Students concentrate on mathematics and science, written and oral communication skills, and mechanical specialization classes, including drafting, statics, strength of materials, machine design, fluid mechanics and motors/motor controllers. Many of the technical courses provide a combination of lecture and laboratory experiences. Graduates with the associate of science degree are qualified for entry-level positions as technicians, engineering assistants, and engineering aids. Job responsibilities can include a broad range of duties such as the installation, operation, maintenance, troubleshooting and repair of manufacturing equipment and commercial mechanical products.

Required Courses (60 hrs.)

COMM 2200 OR 2201 OR 2202 HUMAN COMMUNICATION .......... 3
ELEC 1100 CIRCUIT ANALYSIS I ............................................. 3
ELEC 2250 AC-DC MACHINERY AND CONTROLS .................... 3
ENGL 1104 WRITTEN ENGLISH I .......................................... 3
ENGL 1109 TECHNICAL REPORT WRITING ............................ 3
MATH 1100 MATERIALS AND PROCESSES ............................. 3
MATH 1101 APPLIED TECHNICAL MATH I ............................. 3
MATH 1102 APPLIED TECHNICAL MATH II ............................ 3
MECH 1100 STATICS .................................................................. 3
MECH 2200 STRENGTH OF MATERIALS .................................. 4
MECH 2210 THERMODYNAMICS I ............................................ 3
MECH 2220 FLUID MECHANICS .............................................. 3
PHYS 1101 INTRODUCTION TO PHYSICS I .............................. 4
PHYS 1102 INTRODUCTION TO PHYSICS II ............................ 4
TECH 2290 ENGINEERING ANALYSIS I ................................. 3
TECH 1108 ENGINEERING GRAPHICS I ................................. 3
TECH 2208 ENGINEERING GRAPHICS II ............................... 3
FREE ELECTIVE ....................................................................... 2

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY: MECHANICAL ENGINEERING TECHNOLOGY (ETAC of ABET Accredited) ..................... 120 SEM. HRS.

Mechanical Engineering Technology

Curriculum (see below) ......................................................... 83 SEM. HRS.

General Studies Requirements ................................. 37 SEM. HRS.

(See “Degree Requirements” for General Studies requirements not completed through the major)

The Bachelor of Science degree provides students with a greater emphasis on design and analysis, with advanced courses in dynamics, thermodynamics, heat transfer, heating/ventilation/air conditioning systems and mechanical measurements. Special emphasis is placed on the practical industrial applications of basic engineering concepts and principles. Graduates with the Bachelor of Science degree are qualified for positions that range from technician up through mechanical engineer. Our graduates have been employed by a broad range of manufacturing companies including aerospace, automotive, chemical, nuclear, and steel, mining, as well as telephone, natural gas, and electric utilities. Baccalaureate graduates are eligible to sit for the Fundamentals of Engineering Exam (FE) in West Virginia, the first step to becoming a professional engineer.

- Mechanical Engineering Technology

Curriculum................................................................. 83 SEM. HRS.

Required Courses (74 hrs.)

CHEM 1101 GENERAL CHEMISTRY I ...................................... 4
COMP 1101 APPLIED TECHNICAL PROGRAMMING .............. 3
ELEC 1100 CIRCUIT ANALYSIS I ............................................. 3
ELEC 2250 AC-DC MACHINERY AND CONTROLS .................... 3
MANF 1100 MATERIALS AND PROCESSES ........................... 3
MATH 1102 APPLIED TECHNICAL MATHEMATICS II ............. 3
MECH 1100 STATICS ............................................................. 3
MECH 2200 STRENGTH OF MATERIALS .................................. 4
MECH 2210 THERMODYNAMICS I ............................................ 3
MECH 2220 FLUID MECHANICS .............................................. 3
MECH 2240 MACHINE DESIGN I ............................................ 3
MECH 3300 THERMODYNAMICS II ................................------- 3
MECH 3320 DYNAMICS ......................................................... 3
MECH 3330 HEAT TRANSFER .................................................. 3
MECH 3340 HEATING, AIR CONDITIONING AND VENTILATION .... 3
MECH 4400 MECHANICAL MEASUREMENTS ......................... 3
MECH 4410 THERMODYNAMICS III ...................................... 3
MECH 4430 HEAT TRANSFER .................................................. 3
PHYS 1102 INTRODUCTION TO PHYSICS II ........................... 4
TECH 1108 ENGINEERING GRAPHICS I ................................. 3
TECH 2208 ENGINEERING GRAPHICS II ............................... 3
TECH 2290 ENGINEERING ANALYSIS I ............................... 4
TECH 3300 ENGINEERING ANALYSIS II .............................. 4

Electives (9 hrs.)

CIVL 2200 INTRODUCTION TO SURVEYING ............................ 3
CIVL 2210 LIGHT CONSTRUCTION ......................................... 3
CIVL 2290 INTRODUCTION TO STRUCTURES ......................... 3
COMP 1102 PRINCIPLES OF PROGRAMMING I ....................... 3
COMP 1108 PRINCIPLES OF PROGRAMMING II ...................... 3
COMP 2200 OBJECT-ORIENTED PROGRAMMING ................... 3
COMP 2201 MACHINE ORGANIZATION .................................. 3
DRFT 2205 INTRODUCTION TO SOLID MODELING ................. 3
DRFT 2225 DESCRIPTIVE GEOMETRY ................................... 3
DFRT 2995 TOOL DESIGN ...................................................... 4
ELEC 2210 CIRCUIT ANALYSIS II ............................................ 3
ELEC 2280 PROGRAMMABLE CONTROLLERS ........................... 3
BISM 2600 INTRODUCTION TO NETWORKING ADMINISTRATION ... 3
MANF 2205 ENGINEERING ECONOMY .................................. 3
MATH 3303 APPLIED STATISTICS ....................................... 4
MATH 3316 CALCULUS III ..................................................... 4
MATH 3335 PROBABILITY & STATISTICS .............................. 3
MATH 3362 LINEAR ALGEBRA ............................................. 3
MATH 4401 DIFFERENTIAL EQUATIONS ................................. 3
MECH 3350 NUMERICAL METHODS ..................................... 3
SFTY 1100 SAFETY & ENVIRONMENTAL COMP. OF INDUSTRY .... 3
SFTY 2250 SAFETY LAW & COMPLIANCE .............................. 3
TECH 3399 ADVANCED PLCs .............................................. 3
TECH 4401 WORK EXPERIENCE LABORATORY ..................... 8

- General Studies Requirements ........................................... 37 SEM. HRS.

(when choices are available, see the full General Studies Curriculum in Appendix A.)

Attribute IA-Critical Analysis:

MECH 1100 (Satisfied in major) ........................................... X

Attribute IB-Quantitative Literacy:

MATH 1101 ................................................................. 3
The Occupational Safety program is accredited by the Applied Science Accreditation Commission of ABET, http://www.abet.org. The Occupational Safety program prepares competent professionals who serve as valued members of the management, engineering, and business team providing solutions to complex safety/environmental problems. This program focuses on principles drawn from engineering technology, health, physics, math, psychology, language and speech. Hands-on applications of these principles are emphasized through preparatory and professional courses. Preparatory courses include math, chemistry, physics, human anatomy, statistics, speech, written composition and psychology. Professional courses include industrial hygiene and toxicology, safety engineering and design, systems safety, safety and environmental law, fire prevention, ergonomics, environmental hazard control, OSHA compliance, and program management. Computer skills and experiential learning is heavily emphasized, including laboratory activities, industrial projects and/or internships. Internships may be paid or unpaid and can include academic credit.

The curriculum is a highly flexible 2 + 2 curriculum. Once the two-year degree is earned, graduates may choose to enter the workforce or continue their education with two additional years at the baccalaureate level. The need for Safety/Environmental professionals will continue to grow in response to industry needs. Major employers of our graduates include oil/gas, mining, manufacturing, construction, and insurance companies in the private sector. State and Federal governments also seek safety graduates striving to enhance public health and employee well-being. Increased emphasis on ergonomics, hazardous waste, accident costs, workers’ compensation, regulatory compliance, and health hazard control requires the expertise of competent safety professionals.

### ASSOCIATE OF SCIENCE IN SAFETY ENGINEERING TECHNOLOGY

**Required Courses (60 hrs.)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
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<tr>
<td>PHED 2211</td>
<td>ANATOMY AND PHYSIOLOGY PLUS LAB</td>
<td>4</td>
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<tr>
<td>CHEM 1101</td>
<td>GENERAL CHEMISTRY I</td>
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<td>INTRODUCTION TO PHYSICS I</td>
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<td>SAFETY LAW AND COMPLIANCE</td>
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<td>SFTY 2270</td>
<td>CONSTRUCTION SAFETY &amp; LAW</td>
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<td>INDUSTRIAL HYGIENE AND TOXICOLOGY</td>
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<td>SFTY 2291</td>
<td>ENVIRON. ENGR. TECHNOLOGY: HAZARDOUS WASTE</td>
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<tr>
<td>SFTY 3360</td>
<td>FIRE PREVENTION</td>
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### BACHELOR OF SCIENCE:

**OCCUPATIONAL SAFETY**

**Occupational Safety Curriculum**

(see below).................................................. 78 SEM. HRS.

**General Studies Requirements**.................................. 36 SEM. HRS. (See “Degree Requirements” for General Studies requirements not completed through the major)

**Electives**..................................................... 6 SEM. HRS.

**Occupational Safety Curriculum**.................................. 78 SEM. HRS.

**Required Courses (78 hrs.)**

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<td>SAFETY MGT. &amp; CONCEPTS IN ACCIDENT PREV.</td>
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<td>SFTY 2250</td>
<td>SAFETY LAW &amp; COMPLIANCE</td>
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<td>SFTY 2280</td>
<td>CONSTRUCTION SAFETY &amp; LAW</td>
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<td>INDUSTRIAL HYGIENE AND TOXICOLOGY</td>
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<td>SFTY 2291</td>
<td>ENVIRONMENTAL ENGR. TECH.: HAZARDOUS WASTE</td>
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<tr>
<td>SFTY 3300</td>
<td>INDUSTRIAL HYGIENE APPLICATIONS AND PRACTICES</td>
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<td>SFTY 3310</td>
<td>ERGONOMICS &amp; HUMAN FACTORS</td>
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<td>SFTY 3355</td>
<td>AIR AND WATER POLLUTION</td>
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<td>SFTY 3360</td>
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<td>SFTY 4415</td>
<td>SAFETY INTERNSHIP</td>
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<td>SFTY 4400</td>
<td>SAFETY ENGINEERING DESIGN</td>
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<td>SFTY 4420</td>
<td>SYSTEM SAFETY AND MANAGEMENT</td>
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<td>APPLICATION OF SAFETY STRATEGIES</td>
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<td>BSBA 3306</td>
<td>BUSINESS LAW I</td>
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</table>
MINOR IN OCCUPATIONAL SAFETY … 23-24 SEM. HRS.

Required Courses (20 hrs.)

SFTY 1100 SAFETY & ENVIRONMENTAL COMP. OF INDUSTRY … 3
SFTY 1150 SAFETY MGT. & CONCEPTS IN ACCIDENT PREVENTION … 3
SFTY 2250 SAFETY LAW & COMPLIANCE … 3

ELECTIVES (3-4 hrs.)

PHED 2211 ANATOMY AND PHYSIOLOGY … 4
MATH 1113 APPLIED STATISTICS … 3
MECH 1100 STATICS … 3
PSYC 2240 STATISTICS … 4

GRAPHICS TECHNOLOGY

The associate’s degree in Graphics Technology provides students with a basic understanding of visual communications and the entry level design and technical skills. The Bachelor of Science degree provides students with a concentration in design theory and proficiency in computer and multimedia technologies that will allow them to enter the profession at a more advanced level.

Graduates with the associate degree are qualified for entry-level positions to work as layout artists, graphic design assistants, or Web design technicians. Graduates with the Bachelor of Science degree are qualified for entry-level positions as graphic designers, art directors, creative directors, Web designers, digital pre-press technicians, technical illustrators, desktop publishing artists or production artists.

BACHELOR OF SCIENCE IN GRAPHICS TECHNOLOGY: ELECTRONIC PUBLISHING/IMAGING

SPECIALIZATION … 120 SEM. HRS.

Electronic Publishing/Imaging Curriculum (see below) … 64 SEM. HRS.
General Studies Requirements … 45-47 SEM. HRS.
Free Electives … 9-11 SEM. HRS.

Required Courses (64 hrs.)

ART 1140 DESIGN I: 2D … 3
ART 1141 DESIGN II: 3D … 3
GRAP 1100 GRAPHICS COMMUNICATIONS PROCESSES … 3
GRAP 1125 MULTIMEDIA CONCEPTS … 3
GRAP 1150 COMPUTER APPLICATIONS TO GRAPHICS … 3
GRAP 2210 GRAPHICS-METHODS AND MATERIALS … 3
GRAP 2230 GRAPHIC DESIGN I … 3
GRAP 2235 GRAPHIC DESIGN II … 3
GRAP 2240 PHOTOGRAPHY CONCEPTS … 3
OFAD 2250 DESKTOP PUBLISHING … 3
GRAP 2290 IMAGE EDITING … 3
GRAP 2995 GRAPHICS PRACTICUM … 3
GRAP 3330 BRANDING AND IDENTIY DESIGN … 3
GRAP 3336 MOTION GRAPHICS … 3
GRAP 3370 PORTFOLIO PROCESS … 3
GRAP 4410 ADVANCED TOPICS IN GRAPHICS … 3
GRAP 4430 MULTIPAGE DOCUMENTS AND DESIGN … 3
GRAP 4435 INTERACTIVE AND MULTIMEDIA DESIGN … 3
GRAP 4455 ANIMATION STUDIO … 3
GRAP 4490 EXHIBITION DESIGN AND DEVELOPMENT … 3
TECH 1101 INTRODUCTION TO TECHNOLOGY … 3
RECOMMENDED ELECTIVES

ART 3378 ART HISTORY FROM 1750 TO 1950.................3
GRAP 2255 INTERNET ANIMATION...............................3
GRAP 2280 INTERNET PUBLISHING...........................3
GRAP 2285 ELECTRONIC ART ....................................3

MINOR IN GRAPHICS TECHNOLOGY .....................................21 SEM. HRS.

Required Courses (21 hrs.)

GRAP 1100 GRAPHICS COMMUNICATIONS PROCESSES.........3
GRAP 1150 COMPUTER APPLICATIONS TO GRAPHICS...........3
GRAP 2200 INTRODUCTION TO DESKTOP PUBLISHING..........3
-OR-
OFAD 2250 DESKTOP PUBLISHING.................................3
GRAP 2210 GRAPHICS-METHODS AND MATERIALS...............3
GRAP 2230 GRAPHIC DESIGN I .......................................3
GRAP 2240 PHOTOGRAPHY CONCEPTS.........................3
GRAP 2265 ESTIMATING AND COST ANALYSIS....................3

• General Studies Requirements.................................45-47 SEM. HRS.
  (when choices are available, see the full General Studies
  Curriculum in Appendix A.)

  Attribute IA – Critical Analysis
  ENGL 1109 Technical Report Writing..........................3
  Attribute IB – Quantitative Literacy
  MATH 1107 or Higher in IB ........................................3
  Attribute IC – Written Communication
  ENGL 1104 ...................................................................3
  Attribute ID - Teamwork
  TECH 1101 (Satisfied in the Major)......................X
  Attribute IE – Information Literacy
  ENGL 1108 ...................................................................3
  Attribute IF – Technology Literacy
  TECH 1100 ..................................................................3
  Attribute IG – Oral Communication
  COMM 2200 or 2201 or 2202 ........................................3
  Attribute III - Citizenship
  HIST 1107 or 1108 or POLI 1103 .................................3
  Attribute IV - Ethics
  MANF 2250 Total Quality and SPC ..............................3
  Attribute V - Health
  Any Course in V .........................................................2-3
  Attribute VI - Interdisciplinary
  Any Course in VI ........................................................3
  Attribute VI A - Arts
  Any Course in VI A .....................................................3
  Attribute VI B - Humanities
  Any Course in VI B .....................................................3
  Attribute VI C – Social Sciences
  Any Course in VI C .....................................................3
  Attribute VI D - Natural Science
  Any Course in VI D ...................................................4-5
  Attribute VIII – Cultural Awareness
  Any Course in VIII .....................................................3

TECHNOLOGY

MINOR IN TECHNOLOGY ...............................................23 SEM. HRS.

Required Courses (15 hrs.)

ELEC 1100 CIRCUIT ANALYSIS I ........................................3
TECH 1108 ENGINEERING GRAPHICS I .......................3
MANF 1100 MATERIALS AND PROCESSES .................3
MANF 2250 TOTAL QUALITY AND SPC .......................3
SFTY 1100 SAFETY & ENVIR COMPONENTS OF INDUSTRY ....3

Electives (8 hrs.)
Technology Electives (advisor approved) (8 hrs)