Programs of Study

College of Science and Technology

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Department of Natural Sciences

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315 Hunt Haught Hall / (304) 367-4393
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FACULTY

BAUR, ANDREAS (2000)
Professor of Chemistry

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

BLEHER, SIEGFRIED (2014)
Assistant Professor of Physics

COOK, RACHEL (2015)
Assistant Professor of Biology

DAVIS, KAREN (2017)
Student Outreach Specialist
NASA Educator Resource Center

ENSIGN, TODD (2005)
Educator Outreach Specialist
Program Manager, NASA Educator Resource Center

FLOOD, MARK R. (1994)
Professor of Biology

HANSEN, GALEN J. (1994)
Professor of Physics

HARVEY, ERICA L. (1994)
Professor of Chemistry

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

HENSON, KRISTY (2018)
Assistant Professor of Forensic Science

Associate Professor of Biology

LYDEN, MICHAEL (2016)
Educator Outreach Specialist
NASA Educator Resource Center

MORRIS, TONY E. (1994)
Professor of Biology

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

ROOF, STEVEN K. (1994)
Professor of Biology

SCANLON, MATTHEW (1991)
Professor of Chemistry

WEEKLEY, JAMES (2005)
Instructor of Chemistry

YEAGER, PHILLIP E. (1999)
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. The School of Dentistry at West Virginia University 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 ........................................ 8
- CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL
  BIOCHEMISTRY................................................................. 9
- CHEM 2201, 2202 ORGANIC CHEMISTRY I, II ............................ 8
- ENGL 1101, 1102 WRITTEN ENGLISH I, II .................................. 6
- PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II ......................... 8

Courses in the humanities, social sciences, and advanced courses in biology are also 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 1101, 1102 WRITTEN ENGLISH I, II ................................ 6
- BIOL 1105, 1106 BIOLOGICAL PRINCIPLES I, II ......................... 8
- CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL
  BIOCHEMISTRY................................................................. 9
- CHEM 2201, 2202 ORGANIC CHEMISTRY I, II ............................ 8
- MATH 1530 or 1430 COLLEGE ALGEBRA .................................. 3 or 4
- MATH 1550 APPLIED STATISTICS .......................................... 3

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.

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 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 .......................... 8
- CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL
  BIOCHEMISTRY................................................................. 9
- CHEM 2201, 2202 ORGANIC CHEMISTRY I, II ............................ 8
- ENGL 1101, 1102 WRITTEN ENGLISH I, II .................................. 6
- PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II ......................... 8

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.

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.
school. Students without the necessary prerequisites for calculus will be required to take MATH 1540 or 1530 and 1540. The pre-pharmacy advisor should be consulted prior to scheduling each semester.

BIOL 1105, 1106 BIOLOGICAL PRINCIPLES I, II ........................................ 8
BIOL 2205, 2206 TECHNICAL MICROBIOLOGY (LECTURE & LAB) ........................................ 4
-OR-
BIOL 2224 Microbiology ........................................ 4
BSBA 2200 ECONOMICS ........................................ 3
-OR-
BSBA 2211, 2212 ECONOMIC PRINCIPLES AND PROBLEMS I, II ...... 6
CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL BIOCHEMISTRY ........................................ 9
CHEM 2201, 2202 ORGANIC CHEMISTRY I, II ........................................ 8
COMM 2200 INTRODUCTION TO HUMAN COMMUNICATION .......... 3
ENGL 1101, 1102 WRITTEN ENGLISH I, II ........................................ 6
MATH1550 APPLIED STATISTICS ........................................ 3
-OR-
BSBA 3310 BUSINESS AND ECONOMICS STATISTICS ........................................ 3
MATH1585 APPLIED CALCULUS ........................................ 4
-OR-
MATH2501 CALCULUS I ........................................ 4
PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II ........................................ 8

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 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:

BIOL 1105, 1106 BIOLOGICAL PRINCIPLES I, II ........................................ 8
CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL BIOCHEMISTRY ........................................ 9
MATH1550 APPLIED STATISTICS ........................................ 3
-OR-
BSBA 3310 BUSINESS AND ECONOMICS STATISTICS ........................................ 3
PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II ........................................ 8
PSYC 1101 INTRODUCTION TO PSYCHOLOGY I ........................................ 3
PSYC 3330 DEVELOPMENTAL PSYCHOLOGY ........................................ 3
ATTR* 219 HUMAN ANATOMY (RECOMMENDED)
-OR-
NBAN** 205 HUMAN ANATOMY ........................................ 3
PSIO*** 441 HUMAN PHYSIOLOGY (RECOMMENDED) ........................................ 4
-OR-
PSIO*** 241 ........................................ 4
-OR-
BIOL*** 235 ........................................ 4

* 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 Fairmont State University 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) .................................................. 63 SEM. HRS.
- No Minor Required
- General Studies Requirements .................................................. 30 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 (51 hrs)
  BIOL 1105  BIOLOGICAL PRINCIPLES I  ..................................... 4

- OR

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<td>BIOL 4485</td>
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**• Biology Electives** .................................................. 12 SEM. HRS.

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<td>DEVELOPMENTAL BIOLOGY</td>
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**• Additional requirements for Biotechnology Emphasis** .................................. 25-27 SEM. HRS.

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<td>CHEM 3315</td>
<td>INSTRUMENTAL ANALYSIS</td>
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**• General Studies Requirements** .................................................. 35 SEM. HRS

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<th>Outcome 4</th>
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<th>Outcome 5</th>
<th>Information Literacy</th>
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ENGL 1102 (Institutional Requirement) ........................................ 3

Outcome 6 - Technology Literacy
TECH 1100* ........................................................................ 3

Outcome 7 - Oral Communication
COMM 2200* ........................................................................ 3

Outcome 8 - Citizenship
POLI 1100* ........................................................................ 3

Outcome 9 - Ethics
ENGL 2220* ........................................................................ 3

Outcome 10 - Health
PHED 1100* ........................................................................ 2

Outcome 11 - Interdisciplinary
POLI 1100* ........................................................................ X

Outcome 12 - Arts
INTR 1120* ........................................................................ 3

Outcome 13 - Humanities
INTR 1120* ........................................................................ X

Outcome 14 - Social Sciences
GEOG 2210* ................................................................. 3

Outcome 15 - Natural Science
CHEM 1105 (PR for CHEM 1106) ........................................ X

Outcome 16 - Cultural Awareness
GEOG 2210* ........................................................................ X

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

MINOR IN BIOLOGY .......................................................... 24 SEM. HRS.

Required courses (16 hrs.)
BIOL 1105 BIOLOGICAL PRINCIPLES I ................................ 4
BIOL 1106 BIOLOGICAL PRINCIPLES II ............................ 4
BIOL 2202 GENERAL BOTANY ........................................... 4
BIOL 2203 GENERAL ZOOLOGY ........................................... 4

Electives (8 hrs.)

Students may choose from any biology course of level 1199 or higher.

BACHELOR OF ARTS IN EDUCATION:
SPECIALIZATION IN BIOLOGY

Outcomes 1 - Critical Analysis
ENGL 1102 (Institutional Requirement) .................................. 3

Outcome 2 - Quantitative Literacy
MATH 1540 OR 1510 (PR for MATH 1520) .......................... 4

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ................................. 3

Biology Curriculum ................................................................ 49 SEM. HRS.

Required courses (52 hrs.)
BIOL 1105 BIOLOGICAL PRINCIPLES I ............................... 4
BIOL 1106 BIOLOGICAL PRINCIPLES II ............................ 4
BIOL 2202 GENERAL BOTANY ........................................... 4
BIOL 2203 GENERAL ZOOLOGY ........................................... 4
BIOL 3306 FUNDAMENTALS OF ECOLOGY .......................... 4
BIOL 3380 GENETICS ......................................................... 4
CHEM 1105 CHEMICAL PRINCIPLES .................................. 5
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY .................. 4
GEOL 1102 HISTORICAL GEOLOGY .................................... 4
MATH 1540 TRIGONOMETRY ............................................... 3

-OR-
MATH 1520 APPLIED TECHNICAL MATHEMATICS II ......... 3
PHYS 1101 INTRODUCTION TO PHYSICS I .......................... 4
PHSC 4430 SCIENCE INTEGRATION SEMINAR .................... 1
PHSC 4431 METHODS AND MATERIALS IN TEACHING SCIENCE ...... 3
SCIE 1120 METEOROLOGY ................................................... 4

All courses in the specialization and the Praxis II Exam must be completed prior to admission to Secondary Student Teaching.

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 SEM. HRS.

Outcome 1 - Critical Analysis
ENGL 1102 (Institutional Requirement) ................................. 3

Outcome 2 - Quantitative Literacy
MATH 1540 OR 1510 (PR for MATH 1520) .......................... 4

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ................................. 3
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.
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.)

BIOL 3360 BIOCHEMISTRY .......................... 4
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
MATH**1585 APPLIED CALCULUS I ................................................. **4
-OR-
MATH**2501 CALCULUS I .......................................................... **4
MATH 1586 APPLIED CALCULUS II ................................................ **4
-OR-
MATH 2502 CALCULUS II ............................................................. 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

* Note: MATH 1585 (or MATH 2501) is required for the chemistry major; the hours for this course are counted under General Studies requirements, Outcome 2.

** Students who do not meet the prerequisites for MATH 1585 or 2501 will be required to take MATH 1430 or MATH 1530 and/or MATH 1585.

- 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 1550 APPLIED STATISTICS .................................................. 3

- General Studies Requirements ....................................................... 42-45 SEM. HRS.

Outcome 1 - Critical Analysis
ENGL 2220* or any other in Outcome 1 ............................................. 3
Outcome 2 - Quantitative Literacy
MATH 1585/2501 (Satisfied in Major) .............................................. 4
Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ........................................... 3
Outcome 4 - Teamwork
CHEM 4412 (Satisfied in Major) ..................................................... X
Outcome 5 - Information Literacy
ENGL 1102 (Institutional Requirement) ........................................... 3
Outcome 6 - Technology Literacy
BISM 1200* or any other in Outcome 6 ......................................... 3
Outcome 7 - Oral Communication
COMM 2200 or 2201 or 2202* ..................................................... 3
Outcome 8 - Citizenship

Any course in Outcome 8 ............................................................... 3
Outcome 9 - Ethics
ENGL 2220* or any course in Outcome 9 ....................................... 3
Outcome 10 - Health
PHED 1100* or any other course in Outcome 10 .......................... 2-5
Outcome 11 - Interdisciplinary
Any course in Outcome 11 ........................................................... 3
Outcome 12 - Arts
Any course or combination of courses in Outcome 12 .................... 3
Outcome 13 - Humanities
HIST 1107/08* or any other course in Outcome 13 ....................... 3
Outcome 14 - Social Sciences
GEOG 2210* or any other course in Outcome 14 .......................... 3
Outcome 15 - Natural Science
CHEM 1105 (Satisfied in Major) .................................................... X
Outcome 16 - Cultural Awareness
GEOG 2210* or any course in Outcome 16 ................................. 3
Additional General Studies hours
CHEM 3301 (WIC - Satisfied in Major) .......................................... X

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

***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 ...................................... 31 SEM. HRS.

Professional Education Courses .................................... 39 SEM. HRS.

Free Electives 3-5 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 1585 APPLIED CALCULUS I ................................. 4
- OR -
MATH**2501 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
- OR -
PHYS 1105/06 PRINCIPLES OF PHYSICS I, II .................... 10

**Students who do not meet the prerequisites for MATH 1585 or 1190 will be required to take MATH 1430 and/or MATH 1540.

All courses in the specialization AND THE Praxis II Exam must be completed prior to admission to Secondary Student Teaching.

• 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 SEM. HRS.

Outcome 1 - Critical Analysis

ENGL 1102 (Institutional Requirement) ........................... 3

Outcome 2 - Quantitative Literacy

MATH 1540 (Required by Major) ................................. 4

Outcome 3 - Written Communication

ENGL 1101 (Institutional Requirement) ......................... 3

Outcome 4 - Teamwork

COMM 2201* or any other Outcome 4 .......................... 3

Outcome 5 - Information Literacy

ENGL 1102 (Satisfied in Outcome 1) .............................. X

Outcome 6 - Technology Literacy

EDUC 2201 (Satisfied in Major) ................................. X

Outcome 7 - Oral Communication

COMM 2201* or any other Outcome 7 .......................... X

Outcome 8 - Citizenship

POLI 1100* or any other Outcome 8 ............................ 3

Outcome 9 - Ethics

SOCI 2205 or any course in Outcome 9 ......................... 3

Outcome 10 - Health

EDUC 2203 (Satisfied in Major) .............................. X

Outcome 11 - Interdisciplinary

GEOG 2210* or any other course in Attribute 11 ............ X

Outcome 12 - Fine Arts

Any course or combination of courses in Outcome 12 ........ 3

Outcome 13 - Humanities

ENGL 2220* or any other course in Outcome 13 .......... X

Outcome 14 - Social Sciences

PSYC 1101* or any other course in Outcome 14 ............. 3

Outcome 15 - Natural Science

CHEM 1105 (Satisfied in Major) .............................. X

Outcome 16 - Cultural Awareness

ENGL 2220* or any other course in Outcome 16 ............. 3

Additional General Studies hours

EDUC 3331, EDUC 3351(WIC - Satisfied in Major) ............ X

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.
FORENSIC SCIENCE

The Bachelor of Science degree in Forensic Science consists of courses in forensic science, biology, chemistry, mathematics, physics, and general studies 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 FORENSIC SCIENCE .......... 120 SEM. HRS.
Forensic Science Curriculum (see below)* ................. 71 SEM. HRS.
General Studies Requirements (includes specific courses required for the major)................................. 39.4 SEM. HRS.
Electives* ................................................. 8-10 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 128 semester hours.

- Forensic Science Curriculum................................. 71 SEM. HRS.

Required Courses (63 hrs.)

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1106</td>
<td>BIOLOGICAL PRINCIPLES II</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 3360</td>
<td>BIOCHEMISTRY</td>
<td>4</td>
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<td>BIOL 3380</td>
<td>GENETICS</td>
<td>4</td>
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<tr>
<td>BIOL 3390</td>
<td>MOLECULAR BIOTECHNOLOGY</td>
<td>4</td>
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<tr>
<td>CHEM 1105</td>
<td>CHEMICAL PRINCIPLES</td>
<td>5</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>
<td>4</td>
</tr>
<tr>
<td>CHEM 2202</td>
<td>ORGANIC CHEMISTRY II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 2205</td>
<td>ANALYTICAL CHEMISTRY</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 3315</td>
<td>INSTRUMENTAL ANALYSIS</td>
<td>4</td>
</tr>
<tr>
<td>FORS 2201</td>
<td>INTRODUCTION TO FORENSIC SCIENCE</td>
<td>4</td>
</tr>
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<td>FORS 2225</td>
<td>FORENSIC MICROSCOPY AND SPECTROSCOPY</td>
<td>3</td>
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<td>FORS 3200</td>
<td>FORENSIC BIOLOGY</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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<td>FORS 4411</td>
<td>FORENSIC SCIENCE INTERNSHIP</td>
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<td>MATH 1550</td>
<td>APPLIED STATISTICS</td>
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<td>BIOL 2224</td>
<td>MICROBIOLOGY</td>
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<td>CHEM 3301</td>
<td>PHYSICAL CHEMISTRY I</td>
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<td>CHEM 3304</td>
<td>INORGANIC CHEMISTRY I</td>
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<td>CHEM 4404</td>
<td>SYNTHETIC METHODS AND MATERIALS</td>
<td>4</td>
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<tr>
<td>CHEM 4412</td>
<td>PHYSICAL CHEMISTRY II</td>
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Specialization Electives Choose 8 hrs of the following:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>BIOL 2224</td>
<td>MICROBIOLOGY</td>
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<tr>
<td>ANY BIOLOGY</td>
<td>CLASS OF 300 OR HIGHER</td>
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<td>CHEM 3301</td>
<td>PHYSICAL CHEMISTRY I</td>
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<td>CHEM 3304</td>
<td>INORGANIC CHEMISTRY I</td>
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<tr>
<td>CHEM 4404</td>
<td>SYNTHETIC METHODS AND MATERIALS</td>
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</tr>
<tr>
<td>CHEM 4412</td>
<td>PHYSICAL CHEMISTRY II</td>
<td>4</td>
</tr>
</tbody>
</table>

- General Studies Requirements ........................................ 39.4 SEM. HRS.

Outcome 1 - Critical Analysis ...................................... 3
ENGL 1102 (Institutional Requirement)

Outcome 2 - Quantitative Literacy .................................. 4
MATH 1585 or 2501 (Required for accreditation)

Outcome 3 - Written Communication .................................. 3
ENGL 1101 (Institutional Requirement)

Outcome 4 - Teamwork ................................................. 3
CRIM 2295 (Required for accreditation)

Outcome 5 - Information Literacy ..................................... X
ENGL 1102 - Met in Outcome 1

Outcome 6 - Technology Literacy ..................................... 3
TECH 1100* 

Outcome 7 - Oral Communication ...................................... 3
COMM 2200*

Outcome 8 - Citizenship ............................................... 3
POLI 1100*

Outcome 9 - Ethics ..................................................... X
CRIM 2295 (Met in Outcome 4)

Outcome 10 - Health ................................................... 3
CRIM 2212*

Outcome 11 - Interdisciplinary ........................................ X
Met in Outcome 8 with POLI 1100*

Outcome 12 - Arts ...................................................... 3
ANY COURSE LISTED IN Outcome 12,

Outcome 13 - Humanities ............................................... 3
History or Literature that also counts for Outcome 16

Outcome 14 - Social Sciences ........................................ X
Met in Outcome 10 with CRIM 2212

Outcome 15 - Natural Science ......................................... 4-5

101
PHYS 1101 or 1105 (Required for accreditation)
Outcome 16 - Cultural Awareness ................................................. X
History or literature that also counts for Outcome 13
Additional General Studies Hours .............................................. 4.5
PHYS 1102 and 1106 (WIC - Required for accreditation)
Writing Intensive Course met with BIOL 3390 in Major Requirements

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

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) ................................. 47 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 4 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 1540 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 and Praxis II Exam must be completed prior to admission to Secondary Student Teaching.

• 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 SEM. HRS.
Outcome 1 - Critical Analysis
ENGL 1102 (Institutional Requirement) ..................... 3
Outcome 2 - Quantitative Literacy
MATH 1540 (Satisfied in Major) ................................. 3
Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ..................... 3
Outcome 4 - Teamwork
COMM 2201* or any other Outcome 4 ..................... 3
Outcome 5 - Information Literacy
ENGL 1102 (Satisfied in Outcome 1) .......................... X
Outcome 6 - Technology Literacy
EDUC 2201 (Satisfied in Major) ................................. X
Outcome 7 - Oral Communication
COMM 2200* or any other Outcome 7 .................. X
Outcome 8 - Citizenship
POLI 1100* or any other Outcome 8 .......................... 3
Outcome 9 - Ethics
SOCY 2205* or any other course in Outcome 9 ........ 3
Outcome 10 - Health
EDUC 2203 (Satisfied in Major) ................................. X
Outcome 11 - Interdisciplinary
GEOG 2210* ....... 3
Outcome 12 - Fine Arts
Any course or combination of courses in Outcome 12 ........... 3
Outcome 13 - Humanities
ENGL 2220* or any other course in Outcome 13 ........ 3
Outcome 14 - Social Sciences
PSY 1101* or any other course in Outcome 14 .............. 3
Outcome 15 - Natural Science
CHEM 1105 (Satisfied in Major) .................................. X
Outcome 16 - Cultural Awareness
Any course in Outcome 16 ............................................. 3
Additional General Studies hours
EDUC 3331, EDUC 3351 (WIC - Satisfied in Major)

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

**GEOLOGY**

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

**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.)**

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credit Hours</th>
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<tr>
<td>PHYS* 1101/02</td>
<td>INTRODUCTION TO PHYSICS I, II</td>
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<tr>
<td>PHYS 3310</td>
<td>ELECTRICITY AND ELECTRONICS</td>
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<tr>
<td>PHYS 3325</td>
<td>ADVANCED PHYSICS I</td>
<td>4</td>
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<tr>
<td>PHYS 3335</td>
<td>ADVANCED PHYSICS II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 3340</td>
<td>SPECIAL PROBLEMS</td>
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</table>

MATH 1585 APPLIED CALCULUS I ........................................ 4
-MATH 2501 CALCULUS I ............................................... 4
-OR-
TECH 2290 ENGINEERING ANALYSIS I .................................... 4
MATH 1586 APPLIED CALCULUS II ......................................... 4
-OR-
MATH 2502 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**

**GRADVES 9-ADULT** .................................................. 120 SEM. HRS.

Physics Curriculum (see below) .................................... 45-48 SEM. HRS.
General Studies Requirements ........................................ 31 SEM. HRS.
(See “Degree Requirements” for General Studies requirements not completed through the major).
Professional Education Courses .................................... 39 SEM. HRS.
Free Electives* ...................................................... 2-5 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 2502 CALCULUS II ........................................... 4
  -OR-
  MATH 1586 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 IIA, 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 and Praxis II Exam must be completed prior to admission to Secondary Student Teaching. 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 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 SEM. HRS.
  Outcome 1 - Critical Analysis
  ENGL 1102 (Institutional Requirement) ............................... 3
  Outcome 2 - Quantitative Literacy
  MATH 1585 or 1590 (PR for MATH 1586 or MATH 3315)
  or TECH 3300) .................................................................. 4
  Outcome 3 - Written Communication
  ENGL 1101 (Institutional Requirement) ................................. 3
  Outcome 4 - Teamwork
  COMM 2201* or any other course in Outcome 4 .................... 3
  Outcome 5 - Information Literacy
  ENGL 1102 (Satisfied in Outcome 1) .................................. X
  Outcome 6 - Technology Literacy
  EDUC 2201 (Satisfied in Major) .......................................... X
  Outcome 7 - Oral Communication
  COMM 2201* or any other course in Outcome 7 .................... X
  Outcome 8 - Citizenship
  POLI 1100* or any other course in Outcome 8 ..................... 3
  Outcome 9 - Ethics
  SOCY 2205* or any other course in Outcome 9 .................... 3
  Outcome 10 - Health
  EDUC 2203 (Satisfied in Major) ......................................... X
  Outcome 11 - Interdisciplinary
  GEOG 2210* or any other course in Attribute 11 .................. X
  Outcome 12 - Fine Arts
  Any course or combination of courses in Outcome 12 ............ 3
  Outcome 13 - Humanities
  ENGL 2220* or any other course in Outcome 13 ................... X

Outcome 14 - Social Sciences
  PSYC 1101* or any other course in Outcome 14 ................... 3

Outcome 15 - Natural Science
  CHEM 1101 or CHEM 1105 (Satisfied in Major) ..................... X

Outcome 16 - Cultural Awareness
  ENGL 2220* or any other course in Outcome 16 ................... 3

Additional General Studies hours
  EDUC 3331, EDUC 3351 (WIC - Satisfied by Major)

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

Department of Computer Science and Mathematics

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

FACULTY

BAKER, RANDALL (1986)
Assistant Professor of Computer Science

BLACKWOOD, BRIAN (2012)
Associate Professor of Mathematics

CUCHTA, TOM (2016)
Assistant Professor of Mathematics

DEVINE, THOMAS (2015)
Assistant Professor of Computer Security

HOSSAIN, MAHMOOD (2006)
Professor of Computer Science

JONES, STEPHANIE (2015)
Assistant Professor of Mathematics

LARUE, A. DENNINE (2006)
Assistant Professor of Mathematics
LARUE, THEODORE K. (1982)  
Assistant Professor of Computer Science

NIICHEL, ROBERT (2014)  
Assistant Professor of Mathematics

RIESEN, JOSEPH (1992)  
Professor of Mathematics

SMITH, AMANDA (2018)  
Instructor of Supplemental Math

THOMPSON, LYVON (2014)  
Coordinator of Supplemental Math

WALCK, LINDSEY (2016)  
Assistant Coordinator of Supplemental Math

**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 developers, database administrators, cybersecurity analysts, etc. Students interested in computer science have the option of choosing the Cybersecurity concentration.

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. In addition to receiving the necessary skills in computer science, the students also receive a well-balanced mathematics and general studies curriculum.

**NOTES:** It is highly recommended that students attempt to complete COMP 1120, COMP 1130, and MATH 2501 by the end of their freshman year.

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**BACHELOR OF SCIENCE**

**IN COMPUTER SCIENCE** ........................................... 120 SEM. HRS.

Major Curriculum .................................................. 72-75 SEM. HRS.

General Studies Requirements ................................. 35-36 SEM. HRS.

Free Electives 9-13 SEM. HRS.

- Major Curriculum .................................................. 72-75 SEM. HRS.

**Required Courses (55 HRS.)**

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<td>INTRODUCTION TO COMPUTING</td>
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<td>COMP 1120</td>
<td>PRINCIPLES OF PROGRAMMING I</td>
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<td>COMP 1130</td>
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<td>COMP 2200</td>
<td>OBJECT-ORIENTED PROGRAMMING</td>
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<td>COMP 2201</td>
<td>MACHINE ORGANIZATION</td>
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<td>COMP 2230</td>
<td>NETWORK PROGRAMMING</td>
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<td>COMP 2270</td>
<td>DATA STRUCTURES</td>
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<td>COMP 3330</td>
<td>ANALYSIS OF ALGORITHMS</td>
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<tr>
<td>COMP 3395</td>
<td>ETHICAL ISSUES IN COMPUTING</td>
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<tr>
<td>COMP 4400</td>
<td>AUTOMATA THEORY</td>
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<td>COMP 4410</td>
<td>DATABASE MANAGEMENT</td>
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<tr>
<td>COMP 4440</td>
<td>SOFTWARE ENGINEERING</td>
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</tr>
<tr>
<td>MATH 1561</td>
<td>INTRODUCTION TO MATHEMATICAL REASONING</td>
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</tr>
<tr>
<td>MATH 2562</td>
<td>INTRODUCTION TO DISCRETE MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2501</td>
<td>CALCULUS I</td>
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</tr>
<tr>
<td>MATH 2502</td>
<td>CALCULUS II</td>
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</tr>
</tbody>
</table>

**Electives (9-10 HRS.)**  
(At least one COMP and at least one MATH course)

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>COMP 3300</td>
<td>COMPUTER GRAPHICS</td>
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<td>COMP 3310</td>
<td>ARTIFICIAL INTELLIGENCE</td>
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<td>COMP 3380</td>
<td>INTRODUCTION TO CRYPTOGRAPHY</td>
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<td>COMP 4420</td>
<td>SELECTED ADVANCED TOPICS</td>
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<td>COMP 4450</td>
<td>INTRODUCTION TO DATA MINING</td>
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<td>MATHEMATICAL LOGIC</td>
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<td>MATH 3503</td>
<td>CALCULUS III</td>
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<td>MATH 3504</td>
<td>DIFFERENTIAL EQUATIONS</td>
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<td>MATH 3520</td>
<td>LINEAR ALGEBRA</td>
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<td>MATH 3540</td>
<td>NUMERICAL ANALYSIS</td>
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<td>MATH 3550</td>
<td>PROBABILITY AND STATISTICS</td>
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**Science (8-10 HRS.)**

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<td>BIO 1105</td>
<td>BIOLOGICAL PRINCIPLES I</td>
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<td>BIO 1106</td>
<td>BIOLOGICAL PRINCIPLES II</td>
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<td>CHEM 1105</td>
<td>CHEMICAL PRINCIPLES</td>
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<td>CHEM 2200</td>
<td>FOUNDATIONAL BIOCHEMISTRY</td>
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<td>PHYS 1101</td>
<td>INTRODUCTION TO PHYSICS I</td>
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<tr>
<td>PHYS 1102</td>
<td>INTRODUCTION TO PHYSICS II</td>
<td>4</td>
</tr>
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<td>PHYS 1105</td>
<td>PRINCIPLES OF PHYSICS I</td>
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<tr>
<td>PHYS 1106</td>
<td>PRINCIPLES OF PHYSICS II</td>
<td>5</td>
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</tbody>
</table>

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Outcome 1 - Critical Analysis
ENGL 1102 or ENGL 1103* or Choice ........................................... 3

Outcome 2 - Quantitative Literacy
MATH 2501 (Satisfied in Major) .................................................. X

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ........................................ 3

Outcome 4 - Teamwork
COMM 2200* or Choice ........................................................... 3

Outcome 5 - Information Literacy
ENGL 1102 or ENGL 1103 (Met in Outcome 1) ............................... X

Outcome 6 - Technology Literacy
Any course ................................................................................. 3

Outcome 7 - Oral Communication
COMM 2200* or Choice ........................................................... X

Outcome 8 - Citizenship
Any course ................................................................................. 3

Outcome 9 - Ethics
Any course ................................................................................. 3

Outcome 10 - Health and Well-being
Any course .................................................................................. 2

Outcome 11 - Interdisciplinary and Lifelong Learning
Any course ................................................................................. 3

Outcome 12 - Fine Arts
Any course ................................................................................. 3

Outcome 13 - Humanities
Any course ................................................................................. 3

Outcome 14 - Social Science
Any course .................................................................................. 3

Outcome 15 - Natural Science
BIOL 1105 or 1106, CHEM 1105 or PHYS 1102 or 1105
(Required by Major) ................................................................. X

Outcome 16 - Cultural Awareness and Human Dignity
Any course .................................................................................. 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CYBERSECURITY CONCENTRATION ........................................ 120 SEM. HRS.

Major Curriculum ...................................................................... 75-77 SEM. HRS.

General Studies Requirements ............................................... 32-33 SEM. HRS.

Free Electives 10-13 SEM. HRS.

• Major Curriculum ....................................................................... 75-77 HRS.

Required Courses (68 HRS.)

COMP 1100 INTRODUCTION TO COMPUTING ....................... 3

COMP 1120 PRINCIPLES OF PROGRAMMING I ....................... 3

COMP 1130 PRINCIPLES OF PROGRAMMING II ...................... 4

COMP 2200 OBJECT-ORIENTED PROGRAMMING .................. 3

COMP 2201 MACHINE ORGANIZATION .................................... 3

COMP 2220 FUNDAMENTALS OF COMPUTER SECURITY .......... 3

COMP 2230 NETWORK PROGRAMMING .................................. 3

COMP 2270 DATA STRUCTURES ................................................ 3

COMP 3340 OPERATING SYSTEMS ......................................... 3

COMP 3380 INTRODUCTION TO CRYPTOGRAPHY .................. 3

COMP 3390 NETWORK SECURITY ............................................ 3

COMP 3395 ETHICAL ISSUES IN COMPUTING ....................... 3

COMP 4410 DATABASE MANAGEMENT .................................... 3

COMP 4415 VULNERABILITY ASSESSMENT ............................ 4

COMP 4440 SOFTWARE ENGINEERING ................................. 4

COMP 4495 CYBERSECURITY SENIOR PROJECT ................... 3

BISM 2600 INTRODUCTION TO NETWORKING ADMINISTRATION .. 3

CRIM 2250 CYBERCRIME ...................................................... 3

MATH 1561 INTRODUCTION TO MATHEMATICAL REASONING .. 3

MATH2562 DISCRETE MATHEMATICS ..................................... 3

MATH2501 CALCULUS I ............................................................ 4

Elective (3-4 HRS.)

COMP 3310 ARTIFICIAL INTELLIGENCE ................................. 3

COMP 3330 ANALYSIS OF ALGORITHMS ............................. 3

COMP 4400 AUTOMATA THEORY .......................................... 3

COMP 4420 SELECTED ADVANCED TOPICS ......................... 3

COMP 4450 INTRODUCTION TO DATA MINING ...................... 3

MATH2502 CALCULUS II ......................................................... 4

MATH2510 MATHEMATICAL LOGIC ....................................... 3

Science (4-5 HRS.)

BIO 1105 BIOLOGICAL PRINCIPLES I .................................. 4

BIO 1106 BIOLOGICAL PRINCIPLES II .................................. 4

CHEM 1105 CHEMICAL PRINCIPLES .................................... 5

PHYS 1101 INTRODUCTION TO PHYSICS I ............................ 4

PHYS 1105 PRINCIPLES OF PHYSICS I ................................. 5

• General Studies Requirements ............................................. 32-33 SEM. HRS.

Outcome 1 - Critical Analysis
ENGL 1102 or ENGL 1103* or Choice ........................................ 3

Outcome 2 - Quantitative Literacy
MATH 2501 (Satisfied in Major) .................................................. X

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) ........................................ 3

Outcome 4 - Teamwork
COMM 2200* or Choice ........................................................... 3

Outcome 5 - Information Literacy
ENGL 1102 or ENGL 1103 (Met in Outcome 1) ............................... X

Outcome 6 - Technology Literacy
Any course ................................................................................. 3

Outcome 7 - Oral Communication
COMM 2200* or Choice ........................................................... X
Outcome 8 - Citizenship
Any course ...................................................... 3

Outcome 9 - Ethics
Any course ...................................................... 3

Outcome 10 - Health and Well-being
Any course ...................................................... 2-3

Outcome 11 - Interdisciplinary and Lifelong Learning
Any course ...................................................... 3

Outcome 12 - Fine Arts
Any course ...................................................... 3

Outcome 13 - Humanities
Any course ...................................................... 3

Outcome 14 - Social Science
Any course ...................................................... 3

Outcome 15 - Natural Science
BIOL 1105 or 1106, CHEM 1105 or PHYS 1102 or 1105
(Required by Major) .......................................... X

Outcome 16 - Cultural Awareness and Human Dignity
Any course ...................................................... 3

* Any course(s) marked with an asterisk (*) above are recommended
to complement the program curriculum; however, students may select
any other courses from the approved General Studies list.

MINOR IN COMPUTER SCIENCE ..................................19 SEM. HRS.

Required Courses (10 HRS.)
COMP 1120 PRINCIPLES OF PROGRAMMING I .................. 3
COMP 1130 PRINCIPLES OF PROGRAMMING II .................. 4
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
MATH22562 INTRODUCTION TO DISCRETE MATHEMATICS ...... 3

MINOR IN AUTOMATION AND ROBOTICS .......................... 28-29 SEM HRS.

Required Courses for Computer Science Majors pursuing this Minor
(28-29 hrs)
PHYS 1101 or .................................................. Introduction to Physics I
PHYS 1105 Principles of Physics I .................................. 4-5
ELEC 1100 Circuit Analysis I ........................................ 3
ELEC 2250 DC/DC Machinery and Controls ........................ 3
ELEC 2270 Microcomputers ........................................ 3
ELEC 2280 Programmable Controllers ............................. 3
ELEC 4420 Advanced Automation Controller Systems ........... 3
MECH 1100 Statics ................................................. 3
MECH 3320 Dynamics .............................................. 3
TECH 4450 Automation and Robotics ............................... 3

NOTE: the Automation and Robotics Minor is being offered primarily
to those students majoring in Computer Science, Electronics
Engineering Technology, or Mechanical Engineering Technology. For
these three majors, students will need 24-29 additional hours of
courses. For individual students outside of these majors, an estimated
49 hours of courses will be required.

MINOR IN GAME DESIGN ..........................................26 SEM HRS.

Required courses (26 hrs.)
GRFX 1113 Multimedia Concepts ................................... 3
GRFX 1222 Internet Animation ..................................... 3
COMP 1120 Principles of Programming I ........................... 3
COMP 1130 Principles of Programming II .......................... 4
GRFX 3131 Motion Graphics I ....................................... 3
GRFX 4143 Motion Graphics II ...................................... 3
COMP/GRFX 2203 Introduction to Game Principles ................ 3
COMP/GRFX 4460 Game Design and Implementation ............. 4

MATHMATICS

The mission of the mathematics degree program is
to equip students with analytical and problem-
solving skills for careers or graduate study. Classes
develop a student’s ability to apply mathematical
methods and ideas to problems in both 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 1550, 1561, 2563, 2501, 2502, and 3503 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 any 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 general studies 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.)

COMP 1120 PRINCIPLES OF PROGRAMMING I ....................... 3
MATH1550 APPLIED STATISTICS ........................................ 3
MATH 1561 INTRODUCTION TO MATHEMATICAL REASONING ....... 3
MATH2501 CALCULUS I ................................................. 4
MATH2502 CALCULUS II ............................................. 4
MATH2510 MATHEMATICAL LOGIC .................................. 3
MATH 2563 TRANSITION TO HIGHER MATHEMATICS 3 .......... 4
MATH3503 CALCULUS III ............................................... 4
MATH3520 LINEAR ALGEBRA ....................................... 3
MATH3550 PROBABILITY .............................................. 3
MATH4520 ABSTRACT ALGEBRA .................................. 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 I .................................. (5)
PHYS 1101 INTRODUCTION TO PHYSICS I .............................. (4)
PHYS 1105 PRINCIPLES OF PHYSICS I ................................. (5)
BIOL 1105 BIOLOGICAL PRINCIPLES I ............................... (4)
BIOL 1106 BIOLOGICAL PRINCIPLES II ............................. (4)
GEOL 1101 PHYSICAL GEOLOGY .................................. (4)

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

GROUP A:

MATH4580 TOPOLOGY ............................................... 3
MATH4590 REAL ANALYSIS ....................................... 3

GROUP B:

MATH2520 INTRODUCTION TO THE THEORY OF NUMBERS ...... 3
MATH2562 INTRODUCTION TO DISCRETE MATHEMATICS .......... 3
MATH3504 DIFFERENTIAL EQUATIONS ............................ 3
MATH3540 NUMERICAL ANALYSIS ................................ 3
MATH3570 MODERN GEOMETRY .................................. 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.)

Outcome 1 - Critical Analysis:
ENGL 1102 (Institutional Requirement) .................................. 3
Outcome 2 - Quantitative Literacy:
MATH 1507 or 1407 or higher in Outcome 2 (Satisfied in Major) .... X
Outcome 3 - Written Communication:
ENGL 1101 (Institutional Requirement) .................................. 3
Outcome 4 - Teamwork:
COMM 2200* or any course listed in Outcome 4 .................... 3
Outcome 5 - Information Literacy:
ENGL 1102* (Satisfied in Outcome in Outcome 1) or any course listed in Outcome 5 3
Outcome 6 - Technology Literacy:
Any course in Outcome 6 ................................................. 3
Outcome 7 - Oral Communication:
COMM 2200* (Met in Outcome 4) or any course in Outcome 7 .... X
Outcome 8 - Citizenship:
POLI 1100* or any course in Outcome 8 ........................................ 3
Outcome 9 - Ethics:
ENGL 2220* or any course in Outcome 9 ........................................ 3
Outcome 10 - Health:
PHED 1100* or any course in Outcome 10 ....................................... 2-3
Outcome 11 - Interdisciplinary:
POLI 1100* (Met in Outcome 8) or any course in Outcome 11 .......... X
Outcome 12 - Arts:
Any course listed in Outcome 12 .................................................. 3
Outcome 13 - Humanities:
ENGL 2220* (Met in Outcome 9) or any course in Outcome 13 ... X
Outcome 14 - Social Sciences:
GEOG 2210* or any course in Outcome 14 ..................................... 3
Outcome 15 - Natural Science:
PHYS 1101, PHYS 1105, CHEM 1101, CHEM 1105, BIOL 1105, BIOL 1106, OR GEOL 1101 (Satisfied in Major) ......................... 4-5
Outcome 16 - Cultural Awareness:
GEOG 2210* (Met in Outcome 14) or any course in Outcome 16 .... X
Additional General Studies Hours:
MATH 4520 (WIC - Satisfied in Major) ........................................... X
(Writing Intensive Course)

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

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

Required Courses (12 hrs.)
MATH 2501 CALCULUS I ......................................................... 4
MATH 2502 CALCULUS II ....................................................... 4
MATH 3503 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 1550 APPLIED STATISTICS .......................................... 3
MATH 1561 INTRODUCTION TO MATHEMATICAL REASONING .... 3
MATH 2510 MATHEMATICAL LOGIC ......................................... 3
MATH 2520 INTRODUCTION TO THE THEORY OF NUMBERS ........ 3
MATH 2562 INTRODUCTION TO DISCRETE MATHEMATICS .......... 3
MATH 2563 TRANSITION TO HIGHER MATHEMATICS ............... 3
MATH 3504 DIFFERENTIAL EQUATIONS .................................... 3
MATH 3520 LINEAR ALGEBRA ............................................. 3
MATH 3540 NUMERICAL ANALYSIS ....................................... 3
MATH 3550 PROBABILITY I .................................................. 3
MATH 3570 MODERN GEOMETRY ......................................... 3
MATH 4520 ABSTRACT ALGEBRA ....................................... 3
MATH 4580 TOPOLOGY ..................................................... 3
MATH 4590 REAL ANALYSIS ............................................... 3

BACHELOR OF ARTS IN EDUCATION:

SPECIALIZATION IN MATHEMATICS

GRADES 5-ADULT ..................................................120 SEM. HRS.
Mathematics Curriculum (see below) ....................................... 50 SEM. HRS.*
General Studies Requirements ............................................31-32 SEM. HRS.
(See "Degree Requirements" for General Studies requirements not completed through the major)

Professional Education Courses .......................................39 SEM. HRS.
(6 Education hours are counted in the general studies hours)
Free Electives * ......................................................... 5-6 SEM. HRS.

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

• Mathematics Curriculum ..............................................50 SEM. HRS.

Required Courses (47 hrs.)
MATH 1550 APPLIED STATISTICS .......................................... 3
MATH 1561 INTRODUCTION TO MATHEMATICAL REASONING .... 3
MATH 2501 CALCULUS I ......................................................... 4
MATH 2502 CALCULUS II ....................................................... 4
MATH 2510 MATHEMATICAL LOGIC ......................................... 4
MATH 2520 INTRODUCTION TO THE THEORY OF NUMBERS .... 3
MATH 2562 INTRODUCTION TO DISCRETE MATHEMATICS .......... 3
MATH 2563 TRANSITION TO HIGHER MATHEMATICS ............... 3
MATH 3503 CALCULUS III ..................................................... 4
MATH 3520 LINEAR ALGEBRA ............................................. 3
MATH 3550 PROBABILITY I .................................................. 3
MATH 3570 MODERN GEOMETRY ......................................... 3
MATH 4520 ABSTRACT ALGEBRA ....................................... 3
MATH 4531 METHODS & MATERIALS OF TEACHING MATH. ...... 3
COMP 1120 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
BIOL 1105 BIOLOGICAL PRINCIPLES I ................................... (4)
BIOL 1106 BIOLOGICAL PRINCIPLES II ................................... (4)
GEOL 1101 PHYSICAL GEOLOGY ........................................... (4)

Electives (3 hrs.)
(Choose one of the following.)
MATH 4580 TOPOLOGY ..................................................... 3
MATH 4590 REAL ANALYSIS ............................................... 3
Outcome 13 ................................................................. X
Outcome 14 - Social Sciences:
  GEOG 2210* or any course in Outcome 14 ......................... 3
Outcome 15 - Natural Science:
  PHYS 1101, PHYS 1105, CHEM 1101, CHEM 1105, BIOL 1105, BIOL 1106, OR GEOL 1101 (Satisfied in Major) .............. 4-5
Outcome 16 - Cultural Awareness:
  GEOG 2210* (Met in Outcome 14) or any course in Outcome 16.... X
Additional General Studies Hours:
  MATH 4520 (WIC - Satisfied in Major) ............................ X

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

MATHEMATICS TEACHING SPECIALIZATION, GRADES 5-9 .................. 30-31 SEM. HRS.

This specialization prepares teacher candidates for general mathematics through Algebra I. The endorsement can be attached to an elementary education degree or any other teaching specialization.

B.A. in Education.

Required courses (30-31 hrs.)
  MATH 1530 or 1430 COLLEGE ALGEBRA* ....................... 3 or 4
  MATH 1540 TRIG. AND ELEMENTARY FUNCTIONS ............... 3
  MATH 1550 APPLIED STATISTICS .................................. 3
  MATH 1561 INTRODUCTION TO MATHEMATICAL REASONING .... 3
  MATH 2501 CALCULUS I .............................................. 4
  MATH 2551 STRUCTURE OF THE REAL NUMBERS ................ 3
  MATH 2552 DATA ANALYSIS AND GEOMETRY ..................... 3
  MATH 2554 TOPICS IN MATH HISTORY ............................ 2
  MATH 3553 MATH METHODS FOR ELEMENTARY TEACHERS ...... 3
  MATH 4531 METHODS & MATERIALS IN TEACHING MATH ....... 3

*omit if Math ACT greater than or equal to 23

#### Department of Engineering Technology

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413 Engineering Technology Building
(304) 367-4821
hcostello@fairmontstate.edu

#### FACULTY

Assistant Professor of Mechanical Engineering Technology
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.
  AVMA3301 AVIATION HISTORY ............................................ 3
  AVMA3302 AVIATION LAW ................................................ 3
  AVMA3303 AIRLINE OPERATIONS ...................................... 3
  AVMA3304 AVIATION MAINTENANCE MANAGEMENT ............... 3
  AVMA3305 GENERAL AVIATION OPERATIONS ....................... 3
  AVMA3307 AVIATION SAFETY ............................................ 3
  AVMA4402 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 Curriculum ........................................... 39-41 SEM. HRS.
  Free Electives 13-15 SEM. HRS.

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.

  Required Courses (39 hrs.)
  AVMA1100 AIRCRAFT FLIGHT THEORY ................................ 3
  AVMA1102 INTRODUCTION TO AIR TRAFFIC CONTROL ............ 3
  AVMA2206 AVIATION SECURITY ........................................ 3
AVMA2210 AVIATION METEOROLOGY ........................................ 3
AVMA2211 AIRPORT MANAGEMENT ........................................ 3
AVMA2213 AIRPORT PLANNING AND DEVELOPMENT ................. 3
BSBA 2201 PRINCIPLES OF ACCOUNTING ............................... 3
BSBA 3310 BUSINESS AND ECONOMIC STATISTICS .................. 3
BSBA 2204 PRINCIPLES OF MARKETING ............................... 3
SFTY 1100 SAFETY & ENVIRONMENTAL COMP. OF INDUSTRY .... 3
SFTY 1150 SAFETY MGT. & CONCEPTS IN ACCIDENT PREV. ...... 3

Major Electives (Select 6 hrs. from the following courses)
AVMA4401 AVIATION INDUSTRY RESEARCH ............................ 3
AVMA4403 AVIATION PROJECT ............................................ 1-4
AVMA4411 AVIATION INDUSTRY INTERNOSHIP ....................... 3
AVMA4498 UNDERGRADUATE RESEARCH ............................... 1-6

• General Studies Requirements ........................................ 39-42 SEM. HRS.
Outcome 1 - Critical Analysis
ENGL 1102 (Institutional Requirement) .................................... 3
Outcome 2 - Quantitative Literacy
MATH 1510 or 1430 or 1530 (PR for PHYS 1101) ........................ 3
Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) .................................... 3
Outcome 4 - Teamwork
MANF 2250* .......................................................... 3
Outcome 5 - Information Literacy
Met in Outcome 1 with ENGL 1102 ......................................... X
Outcome 6 - Technology Literacy
TECH 1100 or BISM 1200* ............................................. 3
Outcome 7 - Oral Communication
COMM 2200 or 2201 or 2202* ......................................... 3
Outcome 8 - Citizenship
POLI 1100* .......................................................... 3
Outcome 9 - Ethics
Met in Outcome 7 with COMM 2200 or 2201 or 2202 ............... 3
Outcome 10 - Health
Any course listed in Outcome 10 ........................................... 2-3
Outcome 11 - Interdisciplinary
Met in Outcome 8 with POLI 1100 ......................................... X
Outcome 12 - Arts
Any course listed in Outcome 12 ........................................... 3
Outcome 13 - Humanities
Any course listed in Outcome 13 ........................................... 3
Outcome 14 - Social Sciences
BSBA 2200 or 2211 or PSYC 1101 or SOCY 1110* ................. 3
Outcome 15 - Natural Science
PHYS 1101 or 1105 (Physics required to meet certain FAA guidelines for ATP reduction in flight hours) ....................... 4-5
Outcome 16 - Cultural Awareness
Any course listed in Outcome 16 ........................................... 3
Additional General Studies hours ........................................... 0

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

AVIATION ADMINISTRATION / FLIGHT .................................... 120 SEM. HRS.
Aviation Common Core .................................................... 27 SEM. HRS.
Aviation Admin./Flight Curriculum ....................................... 48 SEM. HRS.
General Studies Requirements ......................................... 39-42 SEM. HRS.
Free Electives 3-6 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

Required Courses (48 hrs.)
AVMA1102 INTRO TO AIR TRAFFIC CONTROL .......................... 3
AVMA2201 INSTRUMENT PILOT TECHNOLOGY ........................ 3
AVMA2204 INSTRUMENT PILOT TECHNOLOGY LAB ............... 3
AVMA2206 AVIATION SECURITY ......................................... 3
AVMA2211 AIRPORT MANAGEMENT .................................... 3
AVMA2213 AIRPORT PLANNING & DEVELOPMENT ................. 3
AVMA3300 COMMERCIAL PILOT TECHNOLOGY ....................... 3
AVMA3306 COMMERCIAL PILOT TECHNOLOGY LAB ............... 3
BSBA 2201 PRINCIPLES OF ACCOUNTING ............................ 3
BSBA 2204 PRINCIPLES OF MARKETING ............................ 3
BSBA 3310 BUSINESS AND ECONOMICS STATISTICS ............ 3
SFTY 1100 SAFETY & ENVIRONMENTAL COMPONENTS OF INDUSTRY ............................................ 3
SFTY 1150 SAFETY MANAGEMENT & CONCEPTS IN ACCIDENT PREVENTION ............................................ 3

Major Electives (Select 9 credits from the following)
AVMA1101 PRIVATE PILOT TECHNOLOGY ............................... 3
AVMA1103 PRIVATE PILOT TECHNOLOGY LAB ....................... 3
AVMA4401 AVIATION INDUSTRY RESEARCH AND ANALYSIS .... 3
AVMA4403 AVIATION PROJECT ............................................ 3
AVMA4411 AVIATION INDUSTRY INTERNOSHIP ....................... 3
AVMA4498 UNDERGRADUATE RESEARCH ............................... 3

• General Studies Requirements ........................................ 39-42 SEM. HRS.
Outcome 1 - Critical Analysis
ENGL 1102 (Institutional Requirement) .................................... 3
Outcome 2 - Quantitative Literacy
MATH 1510 or 1430 or 1530 (PR for PHYS 1101) ........................ 3
Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) .................................... 3
Outcome 4 - Teamwork
MINOR IN AVIATION ADMINISTRATION

(Select two courses from the following list.)

Electives (6 hrs.)

Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

MINOR IN AVIATION ADMINISTRATION

(No Flight) 21 SEM. HRS.

Required Courses (15 hrs.)

AVMA1100 AIRCRAFT FLIGHT THEORY .............................................. 3
AVMA1102 INTRODUCTION TO AIR TRAFFIC CONTROL .......................... 3
AVMA2211 AIRPORT MANAGEMENT .................................................. 3
AVMA3303 AIRLINE OPERATIONS .................................................... 3
AVMA3305 GENERAL AVIATION OPERATIONS .............................. 3

Electives (6 hrs.)

(Select two courses from the following list.)

(Flight Option) ........................................................................ 18 SEM. HRS.

Required Courses (12 hrs.)

AVMA1101 PRIVATE PILOT TECHNOLOGY ........................................ 3
AVMA3301 AVIATION HISTORY ...................................................... 3
AVMA3302 AVIATION LAW .......................................................... 3
AVMA3305 GENERAL AVIATION OPERATIONS .............................. 3

Electives (6 hrs.)

(Select two courses from the following list.)

AVMA2211 AIRPORT MANAGEMENT .............................................. 3
AVMA2213 AIRPORT PLANNING AND DEVELOPMENT ........................ 3
AVMA2214 ADVANCED AIR TRAFFIC CONTROL ............................ 3
AVMA3303 AIRLINE OPERATIONS .................................................... 3
AVMA3307 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 ...................................................... 39-42 SEM. HRS.

Free Electives 0-1 SEM. HRS.

*Prerequisite for admission into program - earned A&P license.

This option prepares the student for entry-level management positions in the maintenance field with airlines, aviation manufacturers, repair stations, and fixed base operators. To be admitted to the program, all students must have obtained their FAA Airframe and Powerplant License.

• General Studies Requirements ...................................................... 39-42 SEM. HRS.

Outcome 1 - Critical Analysis

ENGL 1102 (Institutional Requirement) .................................... 3

Outcome 2 - Quantitative Literacy

MATH 1510 or 1430 or 1530 (PR for PHYS 1101) ......................... 3-4

Outcome 3 - Written Communication

ENGL 1101 (Institutional Requirement) ........................................ 3

Outcome 4 - Teamwork

MANF 2250* ............................................................................... 3

Outcome 5 - Information Literacy

Met in Outcome 1 with ENGL 1102 .............................................. X

Outcome 6 - Technology Literacy

TECH 1100* ............................................................................... 3

Outcome 7 - Oral Communication

COMM 2200 or 2201 or 2202* .................................................. 3

Outcome 8 - Citizenship

POLI 1100* ............................................................................... 3

Outcome 9 - Ethics

Met in Outcome 7 with COMM 2200 or 2201 or 2202 ............... X
Outcome 10 - Health
Any course listed in Outcome 10 ............................................ 2-4
Outcome 11 - Interdisciplinary
Met in Outcome 8 with POLI 1100 ........................................... X
Outcome 12 - Arts
Any course listed in Outcome 12 ............................................. 3
Outcome 13 - Humanities
Any course listed in Outcome 13 ............................................. 3
Outcome 14 - Social Sciences
BSBA 2200 or 2211 or PSYC 1101 or SOCY 1110* .................... 3
Outcome 15 - Natural Science
PHYS 1101 or 1105 (Physics required to meet certain FAA guidelines for AIP reduction in flight hours) .......................... 4-5
Outcome 16 - Cultural Awareness
Any course listed in Outcome 16 ............................................. 3
Additional General Studies hours ........................................... 0

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

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 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.

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

(Ebac 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.)

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<tr>
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<tr>
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</table>

- 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.)

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<td>CIVL 3340</td>
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<td>CIVL 4400</td>
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<td>TECH 3300</td>
<td>ENGINEERING ANALYSIS II</td>
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</tbody>
</table>

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.)

Outcome 1 - Critical Analysis:
  MECH 1100 (Satisfied in Major) ............................................. 3

Outcome 2 - Quantitative Literacy:
  MATH 1510 or higher (Required by Major) ................................ 3

Outcome 3 - Written Communication:
  ENGL 1101 (Institutional Requirement) .................................... 3

Outcome 4 - Teamwork:
  CIVL 2200 (Satisfied in Major) ............................................. X

Outcome 5 - Information Literacy:
  ENGL 1103 (Institutional Requirement) .................................... 3

Outcome 6 - Technology Literacy:
  CIVL 2210 (Satisfied in Major) ............................................ X

Outcome 7 - Oral Communication:
  COMM 2202* ................................................................. 3

Outcome 8 - Citizenship:
  HIST 1107* ..................................................................... 3

Outcome 9 - Ethics:
  CIVL 4420 (Satisfied in Major) ............................................. X

Outcome 10 - Health:
  Any Course in Outcome 10 ................................................. 2

Outcome 11 - Interdisciplinary:
  GEOG 2210* or Any Course listed in Outcome 11 ..................... 3

Outcome 12 - Arts:
  Any course in Outcome 12 ................................................. 3

Outcome 13 - Humanities:
  HIST 1107* or any course listed in Outcome 13 (Met by Outcome 8)... X

Outcome 14 - Social Sciences:
  MANF 2205* or any course listed in Outcome 14 ..................... 3

Outcome 15 - Natural Science:
  CHEM 1101 or 1105 ...................................................... (Satisfied in Major) 4-5

Outcome 16 - Cultural Awareness:
  GEOG 2210* or Any course listed in Outcome 16
  (Met by Outcome 11) ....................................................... X

* Any course(s) marked with an asterisk (*) above are recommended
to complement the program curriculum; however, students may select
any other courses from the approved General Studies list.

ELECTRONICS ENGINEERING TECHNOLOGY

The Electronics Engineering Technology program is accredited by the Engineering Technology
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 (46 hrs.)

- ELEC 1100 CIRCUIT ANALYSIS I ........................................... 3
- ELEC 1120 AC/DC ELECTRONICS ANALYSIS ........................ 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 2280 PROGRAMMABLE CONTROLLERS ......................... 3
- MATH 1510 APPLIED TECHNICAL MATH I ............................. 3
- MATH 1520 APPLIED TECHNICAL MATH II ............................. 3
**Required Courses (79 hrs.)**

- Electronics Engineering Technology

- Required General Studies Courses... 14 SEM. HRS.
  - COMM 2202 INTRO. TO COMMUNICATION IN THE WORLD OR WORK... 3
  - ENGL 1101 WRITTEN ENGLISH I...
  - ENGL 1102 WRITTEN ENGLISH II 3
  - HEALTH ELECTIVE...
  - TECH ELECTIVE...

**BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY: ELECTRONICS**

- (ETAC of ABET Accredited) 120 SEM. HRS.
- Electronics Engineering Technology Curriculum (see below)... 79 SEM. HRS.
- General Studies Requirements...
- (See "Degree Requirements" for General Studies requirements not completed through the major)
- Tech Electives 4-6 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
  - Required Courses (79 hrs.)
    - CHEM 1101 GENERAL CHEMISTRY...
    - COMP 1110 INTRODUCTION TO PROGRAMMING...
    - ELEC 1100 CIRCUIT ANALYSIS I...
    - ELEC 1120 AC/DC ELECTRONICS ANALYSIS...
    - ELEC 2210 CIRCUIT ANALYSIS II...
    - ELEC 2225 ELECTRONICS DEVICES...

The Bachelor of Science in Engineering Technology degree provides students 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.

**TECH Electives**

*Other technical related courses, not on this list, that meet the goals of the ELEC program, will be considered for credit as a Technical Elective, on a case-by-case basis.

- General Studies Requirements... 35-37 SEM. HRS.
  (when choices are available, see the full General Studies Curriculum in Appendix A.)

Outcome 1-Critical Analysis:

ENGL 1102 (Institutional Requirement)... 3

Outcome 2-Quantitative Literacy:
MATH 1510 or MATH 1585 or MATH 2501 (Required by Major) ........ X
Outcome 3: Written Communications:
ENGL 1101 (Institutional Requirement) ........................................ 3
Outcome 4: Teamwork:
Any course in Outcome 4 .................................................................. 3
Outcome 5: Information Literacy:
ENGL 1102 (Met in Outcome 1) ......................................................... X
Outcome 6: Technology Literacy:
Any approved course in Outcome 6 .................................................. 3
Outcome 7: Oral Communications:
COMM 2202* ............................................................................. 3
Outcome 8: Citizenship:
HIST 1107 or HIST 1108* ............................................................... 3
Outcome 9: Ethics:
Any course in Outcome 9 ................................................................. 3
Outcome 10: Health:
Any approved course in Outcome 10 ................................................. 2-4
Outcome 11: Interdisciplinary:
Any course in Outcome 11 ............................................................... 3
Outcome 12: Arts:
Any course in Outcome 12 ............................................................... 3
Outcome 13: Humanities:
HIST 1107 or HIST 1108* ............................................................... X
Outcome 14: Social Sciences:
Any Course in Outcome 14 ............................................................... 3
Outcome 15: Natural Science:
PHYS 1101 (Satisfied in Major) ....................................................... X
Outcome 16: Cultural Awareness:
Any Course in Outcome 16 ............................................................. 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

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

Required Courses (19 hrs.)
ELEC 1100 CIRCUIT ANALYSIS I ................................................ 3
ELEC 1120 AC/DC ELECTRONICS ANALYSIS3
ELEC 2210 CIRCUIT ANALYSIS II .............................................. 3
ELEC 2230 DIGITAL ELECTRONICS ......................................... 3
ELEC 2270 INTRO TO MICROCONTROLLER SYSTEMS ........ 3
ELEC 2280 PROGRAMMABLE CONTROLLERS3

MINOR IN AUTOMATION AND ROBOTICS ................................. 24 SEM HRS.

Required Courses for Electronics Engineering Technology Majors pursuing this Minor (24 hrs)

COMP 1120 Principles of Programming I .................................. 3
COMP 1130 Principles of Programming II .................................. 3
COMP 2201 Machine Organization ............................................. 3
MECH 1100 Statics ........................................................................ 3
MECH 2200 ................................................................................ 3
MECH 2240 Machine Design ...................................................... 3
MECH 3320 Dynamics ................................................................. 3
TECH 4450 Automation and Robotics ........................................ 3
NOTE: the Automation and Robotics Minor is being offered primarily to those students majoring in Computer Science, Electronics Engineering Technology, or Mechanical Engineering Technology. For these three majors, students will need 24-29 additional hours of courses. For individual students outside of these majors, an estimated 49 hours of courses will be required.

MECHANICAL ENGINEERING TECHNOLOGY

Mechanical Engineering Technology is a broad and diverse discipline. The program combines rigorous work in technology and engineering with hands-on lab experience. 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 years at the baccalaureate level. The Associate of Science degree in Mechanical Engineering Technology provides technical courses in the fundamentals of mathematics, science, strength of materials, electronics, computer aided drafting, thermodynamics, fluid mechanics, and machine design. Students are also required to take courses that focus on oral and written communication skills. The Bachelor of Science degree provides students a greater emphasis on analysis and design with classes in heat transfer, thermodynamics, dynamics, and mechanical measurements. In addition, student will complete the universities general studies requirements to form a well-rounded education. Classes are small and students interact one-on-one with highly trained and educated faculty. Professors contribute additional time and effort to give every student the opportunity to succeed.

Students have the opportunity to join the student chapter of the Society of Automotive Engineers (SAE). Students design, fabricate and test a Baja buggy and compete in the Baja SAE Series each year. Fairmont State University also offers funded undergraduate
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 1101 WRITTEN ENGLISH I ....................................... 3
ENGL 1103 TECHNICAL REPORT WRITING ............................ 3
MANF1100 MATERIALS AND PROCESSES ................................ 3
MATH1510 APPLIED TECHNICAL MATH I ............................... 3
MATH1520 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
MECH 2240 MACHINE DESIGN I ......................................... 3
PHYS 1101 INTRODUCTION TO PHYSICS I ......................... 4
PHYS 1102 INTRODUCTION TO PHYSICS II ....................... 4
TECH 2290 ENGINEERING ANALYSIS I ............................... 4
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 1110 INTRODUCTION TO PROGRAMMING .............. 3
ELEC 1100 CIRCUIT ANALYSIS I ................................. 3
ELEC 2250 AC-DC MACHINERY AND CONTROLS ............ 3
MANF1100 MATERIALS AND PROCESSES .................... 3
MATH1520 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 I ........................................... 3
MECH 3340 HEATING, AIR CONDITIONING AND VENTILATION ...... 3
MECH 4400 MECHANICAL MEASUREMENTS ..................... 3
MECH 4410 THERMODYNAMICS III .................................. 3

research. The program is accredited by ETAC of ABET.

Graduates are eligible to take the Fundamentals of Engineering Exam as a path to state registration.

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.
MECH 4430 HEAT TRANSFER II ................................................. 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 (Select 9 hrs. from the following list)*

BISM 2600 INTRODUCTION TO NETWORKING ADMINISTRATION.... 3
CIVIL 2200 INTRODUCTION TO SURVEYING ............................ 3
CIVIL 2210 LIGHT CONSTRUCTION ........................................ 3
CIVIL 2290 INTRODUCTION TO STRUCTURES .......................... 3
COMP 1120 PRINCIPLES OF PROGRAMMING I ......................... 3
COMP 1130 PRINCIPLES OF PROGRAMMING II ........................ 4
COMP 2200 OBJECT-ORIENTED PROGRAMMING .................... 3
COMP 2201 MACHINE ORGANIZATION ..................................... 3
DRFT 2205 INTRODUCTION TO SOLID MODELING .................... 3
DRFT 2225 DESCRIPTIVE GEOMETRY ...................................... 3
DRFT 2995 TOOL DESIGN .................................................... 4
ELEC 2210 CIRCUIT ANALYSIS II ........................................... 3
ELEC 2280 PROGRAMMABLE CONTROLLERS ........................... 3
MANF2205 ENGINEERING ECONOMY .................................... 3
MATH1550 APPLIED STATISTICS ........................................... 3
MATH3503 CALCULUS III .................................................... 3
MATH3550 PROBABILITY & STATISTICS ................................. 4
MATH3520 LINEAR ALGEBRA ................................................ 3
MATH3504 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 PLC'S ............................................... 3
TECH 4401 WORK EXPERIENCE LABORATORY ......................... 8

*Other technical related courses, not on this list, that meet the goals of the MECH program, will be considered for credit as a Technical Elective, on a case-by-case basis.

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

Outcome 1-Critical Analysis:
MECH 1100 (Satisfied in major) ........................................... X
Outcome 2-Quantitative Literacy:
MATH 1510 (PR for MATH 1520) ......................................... 3
Outcome 3-Written Communications:
ENGL 1101 (Institutional Requirement) ............................... 3
Outcome 4-Teamwork:
MECH 4430 (Satisfied in Major) .......................................... X
Outcome 5-Information Literacy:
ENGL 1102 (Institutional Requirement) ............................... 3

Outcome 6-Technology Literacy:
TECH 1100* 3
Outcome 7-Oral Communications:
COMM 2200 or 2201 or 2202* ......................................... 3
Outcome 8-Citizenship:
HIST 1107 or 1108* ...................................................... 3
Outcome 9- Ethics:
COMM 2200 or 2201 or 2202* (Satisfied in Outcome 7) ............ X
Outcome 10 - Health:
PHED 1100* ................................................................. 2
Outcome 11-Interdisciplinary:
Any course listed in Outcome 11 ....................................... 3
Outcome 12-Arts:
Any course in Outcome 12 ............................................... 3
Outcome 13-Humanities:
HIST 1107 or 1108* (Satisfied in Outcome 8) ....................... X
Outcome 14 - Social Sciences:
BSBA 2200* ................................................................. 3
Outcome 15-Natural Science:
PHYS 1101 (PR for PHYS 1102) ........................................ 4
Outcome 16-Cultural Awareness:
Any Course in Outcome 16 ................................................ 3
Additional General Studies
MECH 4400 (WIC- Satisfied in Major) ................................ X
Free Elective 1

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

MINOR IN AUTOMATION AND ROBOTICS ................................. 24 SEM HRS.

Required Courses for Mechanical Engineering Technology Majors pursuing this Minor (24 hrs)

COMP 1120 Principles of Programming I ............................... 3
COMP 1130 Principles of Programming II ............................. 3
ELEC 1120 AC/DC Electronics Analysis .............................. 3
ELEC 2230 Digital Electronics ............................................ 3
ELEC 2270 Microcomputers .............................................. 3
ELEC 2280 Programmable Controllers ............................... 3
ELEC 4420 Advanced Automation Controller Systems .......... 3
TECH 4450 Automation and Robotics ................................. 3

NOTE: the Automation and Robotics Minor is being offered primarily to those students majoring in Computer Science, Electronics Engineering Technology, or Mechanical Engineering Technology. For these three majors, students will need 24-29 additional hours of courses. For individual students outside of these majors, an estimated 49 hours of courses will be required.

**Occupational Safety**

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 ........60 SEM. HRS.

Required Courses (60 hrs.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOL 1180 &amp; 1181</td>
<td>Human Anatomy &amp; Physiology</td>
<td>4</td>
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<tr>
<td>CHEM 1101</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1102</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>COMM 2200 OR 2201 OR 2202</td>
<td>Introduction to Career Exploration</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1101</td>
<td>Written English I</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 1102</td>
<td>Written English II</td>
<td>3</td>
</tr>
<tr>
<td>MATH1510</td>
<td>Applied Technical Math I</td>
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</tbody>
</table>

MATH1520 Applied Technical Math II 3
PHYS 1101 Introduction to Physics I 4
SCIE 1100 Human Biology 4
SFTY 1100 Introduction to Safety & Law 3
SFTY 1150 Safety Management and Concepts in Accident Prevention 3
SFTY 2250 Safety Law and Compliance 3
SFTY 2258 Construction Safety & Law 3
SFTY 2290 Industrial Hygiene and Toxicology 4
SFTY 2291 Environ. Engr. Technology: Hazardous Waste 4
SFTY 3360 Fire Prevention 3
TECHNICAL ELECTIVE 3

BACHELOR OF SCIENCE:

OCCUPATIONAL SAFETY 120 SEM. HRS.

Occupational Safety Curriculum (see below) 81 SEM. HRS.

General Studies Requirements 31 SEM. HRS.

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

Electives 8 SEM. HRS.

• Occupational Safety Curriculum 81 SEM. HRS.

Required Courses (81 hrs.)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>BIOL 1180 &amp; 1181</td>
<td>Human Anatomy &amp; Physiology</td>
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<td>BSBA 3306</td>
<td>Business Law I</td>
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<td>CHEM 1102</td>
<td>General Chemistry II</td>
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<td>MANF2250</td>
<td>Total Quality &amp; SPC</td>
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<td>MATH1520</td>
<td>Applied Technical Mathematics II</td>
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<td>MATH1550</td>
<td>Applied Statistics</td>
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<td>MECH 1100</td>
<td>Statics</td>
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<td>PHYS 1101</td>
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<td>PHYS 1102</td>
<td>Introduction to Physics II</td>
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<tr>
<td>SCIE 1100</td>
<td>Human Biology</td>
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<tr>
<td>SFTY 1100</td>
<td>Safety &amp; Environment Components of Industry</td>
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<tr>
<td>SFTY 1150</td>
<td>Safety Mgt. &amp; Concepts in Accident Prev</td>
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<tr>
<td>SFTY 2250</td>
<td>Safety Law &amp; Compliance</td>
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<tr>
<td>SFTY 2280</td>
<td>Construction Safety &amp; Law</td>
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<td>SFTY 2290</td>
<td>Industrial Hygiene and Toxicology</td>
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<td>SFTY 2291</td>
<td>Environmental Engr. Tech.: Haz. Waste</td>
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<td>SFTY 3300</td>
<td>Industrial Hygiene Applications and Practices</td>
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<td>SFTY 3355</td>
<td>Air and Water Pollution</td>
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<td>SFTY 3360</td>
<td>Fire Prevention</td>
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<tr>
<td>SFTY 4415</td>
<td>Safety Internship</td>
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<tr>
<td>SFTY 4400</td>
<td>Safety Engineering Design</td>
</tr>
<tr>
<td>SFTY 4420</td>
<td>System Safety and Management</td>
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</table>

121
Outcome 8

Outcome 7

Outcome 6

Outcome 5

Outcome 4

Outcome 3

Outcome 2

Outcome 1

When choices are available, see the full General Studies Requirements.

Electives (8 hrs.)

BISM 2200 CORPORATE COMMUNICATIONS AND TECHNOLOGY... 3
BSBA 2209 PRINCIPLES OF MANAGEMENT ...3
BSBA 3307 BUSINESS LAW II... 3
BSBA 3319 EMPLOYMENT LAW ...3
CHEM 2201 ORGANIC CHEMISTRY ...4
DRFT 2200 FUNDAMENTALS OF CAD... 3
ELEC 1100 CIRCUIT ANALYSIS I... 3
ELEC 2210 CIRCUIT ANALYSIS II... 3
MANF 1100 MATERIALS & PROCESSES... 3
MANF 2205 ENGINEERING ECONOMY... 3
MATH 1585 APPLIED CALCULUS I... 4
MATH 1586 APPLIED CALCULUS II... 4
MECH 2200 STRENGTH OF MATERIALS... 3
MGMT 3308 HUMAN RESOURCES MANAGEMENT... 3
MGMT 3370 COMPENSATION AND BENEFITS... 3
MGMT 3371 EMPLOYEE RELATIONS... 3
MGMT 3372 HUMAN RESOURCES SELECTION AND EVALUATION... 3
MGMT 3390 ORGANIZATIONAL BEHAVIOR... 3
SPAN 1101 ELEMENTARY SPANISH I... 3
SPAN 1102 ELEMENTARY SPANISH II... 3
TECH 2290 ENGINEERING ANALYSIS I... 4
TECH 3300 ENGINEERING ANALYSIS II... 4

• General Studies Requirements 36 SEM. HRS.

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

Outcome 1 - Critical Analysis:
ENGL 1102 (Institutional Requirement)... 3
Outcome 2 - Quantitative Literacy:
MATH 1510 (PR for MATH 1102)... 3
Outcome 3 - Written Communication:
ENGL 1101 (Institutional Requirement)... 3
Outcome 4 - Teamwork:
SFTY 4480 (Satisfied in Major)... X
Outcome 5 - Information Literacy:
ENGL 1102 (Met in Outcome 1)... X
Outcome 6 - Technology Literacy:
SFTY 3300 (Satisfied in Major)(Writing Intensive Course)... X
Outcome 7 - Oral Communication:
COMM 2202(Preferred), 2200, 2201*... 3
Outcome 8 - Citizenship:
Any Course listed in Outcome 8... 3
Outcome 9 - Ethics:
MANF 2250* (Satisfied in Major)... 3
Outcome 10 - Health:
SCIE 1100 (Satisfied in Major)... 2

Outcome 11 - Interdisciplinary:
SFTY 4480 (Satisfied in Major)... X
Outcome 12 - Arts:
Any course listed in Outcome 12... 3
Outcome 13 - Humanities:
Any course listed in Outcome 13... 3
Outcome 14 - Social Sciences:
PSYC 1101*... 3
Outcome 15 - Natural Science:
CHEM 1101 (PR for CHEM 1102)... 4
Outcome 16 - Cultural Awareness:
Any course listed in Outcome 16... 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

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
SFTY 3360 FIRE PREVENTION... 3
SFTY 2290 INDUSTRIAL HYGIENE AND TOXICOLOGY... 4
SFTY 2291 ENVIRONMENTAL ENGINEERING TECHNOLOGY: HAZARDOUS WASTE... 4

Electives (3-4 hrs.)

PHED 2211 ANATOMY AND PHYSIOLOGY... 4
MATH 1550 APPLIED STATISTICS... 3
MECH 1100 STATICS... 3
PSYC 2240 STATISTICS... 4

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)
Department of
Architecture + Graphics

Philip M. Freeman, AIA, NCARB, Department Chair
404 Engineering Technology Building
(304) 367-4237
Philip.Freeman@fairmontstate.edu

FACULTY

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

KELLY, ROBERT L., AIA, NCARB (2015)
Associate Professor of Architecture

MORPHEW, KIRK L., AIA, NCARB, LEED AP
BD+C (2000)
Professor of Architecture

RAOL, VIJAY (2016)
Assistant Professor of Graphics Technology

SICKMAN, KATIE (2018)
Assistant Professor of Graphic Design Technology

ARCHITECTURE

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 technical 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 60 SEM. HRS.

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 Code</th>
<th>Course Title</th>
<th>Hours</th>
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<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>
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<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>
<td>DESIGN II: FOUNDATION</td>
<td>4</td>
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<tr>
<td>ARCH 2060</td>
<td>BUILDING TECHNOLOGY I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1540</td>
<td>TRIGONOMETRY</td>
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<tr>
<td>MECH 1100</td>
<td>STATICS</td>
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</tbody>
</table>

• General Studies Outcomes (24 hrs.)

Outcome 1 - Critical Analysis
MECH 1100 (Satisfied in Major) X

Outcome 2 - Quantitative Literacy
MATH 1530 X

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement) 3

Outcome 4 - Teamwork
ARCH 3000 (Satisfied in Major) X

Outcome 5 - Information Literacy
ENGL 1102 (Institutional Requirement) 3

Outcome 6 - Technology Literacy
ARCH 2060 (Satisfied in Major) X

Outcome 7 - Oral Communication
ARCH 2060 (Satisfied in Major) X

Outcome 8
Any course listed in Outcome 8 3

Outcome 9 - Ethics
Any course listed in Outcome 9 3

Outcome 10 - Health & Well-being
PHED 1100* 2

Outcome 11 - Interdisciplinary & Lifelong Learning X

Outcome 12 - Art Appreciation
Required Courses (71 hrs.)

• Architecture Curriculum ...........................................71 SEM. HRS.

Program Electives (19 hrs.)

(Choose in consultation with advisor)

ARCH 3001 COMMUNITY DESIGN ASSISTANCE CENTER .......... 3
ARCH 3010 SUSTAINABLE DESIGN................................. 3
ARCH 3080 ARCHITECTURAL PRACTICE PROGRAM I ............ 1-3
ARCH 3085 ARCHITECTURE STUDY + TRAVEL ..................... 3
ARCH 4001 COMMUNITY DESIGN ASSISTANCE CENTER:
MANAGEMENT .......................................................... 3
ARCH 4080 ARCHITECTURAL PRACTICE PROGRAM II .......... 1-3
ART 1140 DESIGN I: 2D................................................. 3
ART 1141 DESIGN II: 3D................................................ 3
ART 1142 DRAWING I: FOUNDATIONS OF DRAWING .......... 3
ART 2241 DRAWING II: DRAWING FROM LIFE .................. 3
[PR: ART 1140 + ART 1142]
ART 2245 E. FOUNDATIONS ............................................ 3
ART 2261 PAINTING I: FOUNDATIONS OF PAINTING .......... 3
[PR: ART 1140 + ART 1142]
ART 2283 SCULPTURE I: FOUNDATIONS OF SCULPTURE ......... 3
[PR: ART 1141]
ART 2284 SCULPTURE II................................................ 3
[PR: ART 2283]
ART 3341 PRINTMAKING I .............................................. 3
[PR: ART 1140 + ART 1142]
ART 3342 PRINTMAKING II ............................................ 3
[PR: ART 3341]
ART 3345 E. INTERMEDIATE ........................................... 3
[PR: ART 2245]
ART 3363 INTERMEDIATE WATER MEDIA I ....................... 3
[PR: ART 1141 + ART 2241]
ART 3364 ADVANCED WATER MEDIA II ............................. 3
[PR: ART 3363]
ART 3374 ART HISTORY FROM PREHISTORY TO 1450 .......... 3
[PR: ENGL 1102]
ART 3376 ART HISTORY FROM 1450 TO 1750 .................... 3

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 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.)

ARCH 1000 DESIGN FUNDAMENTALS I ............................... 4
ARCH 1050 DESIGN FUNDAMENTALS II ............................ 4
ARCH 2000 DESIGN I: FOUNDATION ............................... 4
ARCH 2010 ARCHITECTURAL HISTORY I ......................... 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

• Free Electives ..........................................................4 SEM. HRS.

BACHELOR OF SCIENCE

IN ARCHITECTURE .................................................... 126 SEM. HRS.
Architecture 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)
Outcome 1 - Critical Analysis:
MECH 1100 (Satisfied in Major) ................................................. X

Outcome 2 - Quantitative Literacy:
MATH 1530* ............................................................................. 3

Outcome 3 - Written Communication:
ENGL 1101 (Institutional Requirement) ....................................... 3

Outcome 4 - Teamwork:

ARCH 3000 (Satisfied in Major) ................................................ X

Outcome 5 - Information Literacy:
ENGL 1102 (Institutional Requirement) ....................................... 3

Outcome 6 - Technology Literacy:
Technology Literacy Elective (Satisfied in Major) ............................ X

Outcome 7 - Oral Communication:
ARCH 4000 (Satisfied in Major) ................................................ X

Outcome 8 - Citizenship:
Any Course listed in Outcome 8 .................................................. 3

Outcome 9 - Ethics:
Any Course listed in Outcome 9 .................................................. 3

Outcome 10 - Health:
PHED 1100* ............................................................................. 2

Outcome 11 - Interdisciplinary:
Any Course listed in Outcome 11 .............................................. 3

Outcome 12 - Arts:
ART 1120* .............................................................................. 3

Outcome 13 - Humanities:
Any course listed in Outcome 13 .............................................. 3

Outcome 14 - Social Sciences:
Any Course listed in Outcome 14 .............................................. 3

Outcome 15 - Natural Science:
PHYS 1101 (Required by Major) ............................................. 4

Outcome 16 - Cultural Awareness:
Any course listed in Outcome 16 .............................................. 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

**GRAPHIC DESIGN TECHNOLOGY**

The Graphic Design Technology (GDT) program at Fairmont State University prepares students for careers in the expanding graphic design industry and graduate studies.

The Bachelor of Science degree provides students with a program structure that includes design, conceptual thinking and current technology for 1) print, packaging and digital delivery; 2) interactive and multimedia design, including responsive web site design; and 3) motion graphics including studies in kinetic typography. The program objective is for our students to be proficient in these skills and compete for professional positions upon graduation or further studies in graduate programs.

Graduates from our GDT program are qualified for entry-level positions as Art Directors, Web Designers, and Multi-Media artists and animators. According to the December 2015 US Bureau of Labor Statistics, these starting positions range in salary from
about $64K to $89K and the projected growth is on par with the national average of six percent. Some recent reports have web designers projected higher due to the growing need in many fields for this expertise. Graduates may also pursue further study in animation for careers in commercials, television, video game design, and feature films. Post-Graduate studies in the visual communication field could lead to university-level teaching positions.

BACHELOR OF SCIENCE IN GRAPHIC DESIGN

TECHNOLOGY 120 SEM. HRS.

Required Courses (73 hrs.)

ARCH 1000 DESIGN FUNDAMENTALS
ART 1141 DESIGN II: 3D
ART 3380 ART HISTORY SINCE 1950
COMP 1110 INTRODUCTION TO PROGRAMMING
GRFX 1111 IMAGING I FOUNDATION
GRFX 1113 MULTIMEDIA CONCEPTS
GRFX 1220 MASTER DOCUMENT / DESIGN
GRFX 1222 INTERNET ANIMATION
GRFX 2121 GRAPHIC DESIGN I FOUNDATION
GRFX 2123 PHOTOGRAPHY I FOUNDATION
GRFX 2125 HISTORY OF GRAPHIC DESIGN
GRFX 2220 INFORMATION GRAPHICS
GRFX 2222 TYPOGRAPHY I FOUNDATION
GRFX 3131 MOTION GRAPHICS I
GRFX 3133 TYPOGRAPHY II / BRANDING AND IDENTITY
GRFX 3230 INTERACTIVE AND MULTIMEDIA DESIGN
GRFX 3232 PHOTOGRAPHY II STUDIO & VIDEO TECH
GRFX 3234 MULTIPAGE DOCUMENTS AND DESIGN
GRFX 4141 GRAPHIC DESIGN SENIOR SEMINAR
GRFX 4143 MOTION GRAPHICS II
GRFX 4145 EXHIBITION DESIGN & DEVELOPMENT
GRFX 4240 GRAPHIC DESIGN APPLIED THEORY
GRFX 4242 CAREER AND PORTFOLIO DEVELOPMENT
GRFX 4244 SENIOR INTERNSHIP

* General Studies Requirements .......................... 35-37 SEM. HRS.

Outcome 1 - Critical Analysis
ENGL 1102 (Institutional Requirement).......................... 3

Outcome 2 - Quantitative Literacy
MATH 1510 or MATH 1507 or MATH 1530 .......................... 3

Outcome 3 - Written Communication
ENGL 1101 (Institutional Requirement).......................... 3

Outcome 4 - Teamwork
COMM 2200(*) .............................................. 3

Outcome 5 - Information Literacy
ENGL 1102 (Met in Outcome 1) .................................... X

Outcome 6 - Technology Literacy
ART 2245 (Required by Major) .................................... 3

Outcome 7 - Oral Communication
COMM 2200* (Met in Outcome 4) .................................. X

Outcome 8 - Citizenship
HIST 1107 or 1108* ................................................. 3

Outcome 9 - Ethics
SOCY 1110* .................................................. 3

Outcome 10 - Health
HLTA 1100 OR PHED 1100* ........................................... 2

Outcome 11 - Interdisciplinary
POLI 1100 OR INTR 2280 OR SOCY 2200* ......................... 3

Outcome 12 - Arts
ART 3378 (Graduate programs typically look for three art history courses for GDT students) .................................................. 3

Outcome 13 - Humanities
HIST 1107 OR HIST 1108* (Met in Outcome 8) .................. X

Outcome 14 - Social Sciences
SOCY 1110* (Met in Outcome 9) .................................... X

Outcome 15 - Natural Science
Any Course in Outcome 15 ............................................ 3-5

Outcome 16 - Cultural Awareness
GEOG 3305 OR GEOG 3315* ........................................... 3

* Any course(s) marked with an asterisk (*) above are recommended to complement the program curriculum; however, students may select any other courses from the approved General Studies list.

MINOR IN GRAPHIC DESIGN TECHNOLOGY .......................... 21 SEM HRS.

Required Courses (18 hrs.)

GRFX 1111 Imagine I Foundations .................................... 3
GRFX 1220 Master Document/Design .................................. 3
GRFX 1222 Internet Animation .......................................... 3
GRFX 2121 Graphic Design I Foundations .......................... 3
GRFX 2222 Typographic I Foundations ............................... 3
GRFX 3230 Interactive & Multimedia Design .......................... 3

Elective Courses: select one. (3 hrs.)

GRFX 1113 Multimedia Concepts ...................................... 3
GRFX 2125 History of Graphic Design .................................. 3
GRFX 2123 Photography I Foundations ............................... 3
GRFX 4242 Career and Portfolio Development ....................... 3
MINOR IN GAME DESIGN.........................................................26 SEM HRS.

Required courses (26 hrs.)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GRFX 1113</td>
<td>Multimedia Concepts</td>
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<td>GRFX 1222</td>
<td>Internet Animation</td>
<td>3</td>
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<td>COMP 1120</td>
<td>Principles of Programming I</td>
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<td>COMP 1130</td>
<td>Principles of Programming II</td>
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<td>GRFX 3131</td>
<td>Motion Graphics I</td>
<td>3</td>
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<tr>
<td>GRFX 4143</td>
<td>Motion Graphics II</td>
<td>3</td>
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<tr>
<td>COMP/GRFX 2203</td>
<td>Introduction to Game Principles</td>
<td>3</td>
</tr>
<tr>
<td>COMP/GRFX 4460</td>
<td>Game Design and Implementation</td>
<td>4</td>
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