

Programs of Study

College of Science and Technology

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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

HUGGINS, PAMELA A. (2002)
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 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

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

PRE-MEDICAL TECHNOLOGY CURRICULUM

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

ENGL 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
MATH1530 or 1430 COLLEGE ALGEBRA.....	3 or 4
MATH1550 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

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 Requirements30 SEM. HRS.
 (See "Degree Requirements" for General Studies requirements not completed through the major)
 Free Electives 27 SEM. HRS.

• Biology Curriculum58 SEM. HRS.

Required courses (51 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 3368 ANIMAL PHYSIOLOGY 4
 -OR-
 BIOL 3370 PLANT PHYSIOLOGY 4
 BIOL 3380 GENETICS 4
 BIOL 3390 MOLECULAR BIOTECHNOLOGY 4
 BIOL 4485 SENIOR SEMINAR 2
 CHEM 1105 CHEMICAL PRINCIPLES 5
 CHEM 2200 FOUNDATIONAL BIOCHEMISTRY 4
 CHEM 2201 ORGANIC CHEMISTRY I 4
 CHEM 2202 ORGANIC CHEMISTRY II 4

• Biology Electives 12 SEM. HRS.

BIOL 2224 MICROBIOLOGY 4
 BIOL 3312 ADVANCED BOTANY 4
 BIOL 3315 INVERTEBRATE ZOOLOGY 4
 BIOL 3316 VERTEBRATE ZOOLOGY 4
 BIOL 3330 AQUATIC ECOLOGY 4
 BIOL 3331 TERRESTRIAL ECOLOGY 4
 BIOL 3360 BIOCHEMISTRY 4
 BIOL 4420 DEVELOPMENTAL BIOLOGY 4

• Additional requirements for
 Biotechnology Emphasis.....25-27 SEM. HRS.

BIOL 3360 BIOCHEMISTRY 4
 CHEM 2205 ANALYTICAL CHEMISTRY 4
 CHEM 3301 PHYSICAL CHEMISTRY 4
 CHEM 3315 INSTRUMENTAL ANALYSIS 4
 MATH 1550 APPLIED STATISTICS 3
 PHYS 1101/02 INTRO TO PHYSICS I, II 8
 -OR -
 PHYS 1105/06 PRINCIPLES OF PHYSICS I, II 10

• General Studies Requirements35 SEM. HRS

Outcome 1 - Critical Analysis
 ENGL 2220* 3
 Outcome 2 - Quantitative Literacy
 MATH 1585 or MATH 2501 (PR for BIOL 3390)..... 4
 Outcome 3 - Written Communication
 ENGL 1101 (Institutional Requirement) 3
 Outcome 4 - Teamwork
 COMM 2200* 3
 Outcome 5 - Information Literacy

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 BIOLOGY24 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

GRADES 9-ADULT	120 SEM. HRS.
Biology Curriculum (see below)	49 SEM. HRS.
General Studies requirements	31 SEM. HRS.
Professional Education Courses	39 SEM. HRS.
Free Electives 1 SEM. HR.	

No Minor Required

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

• Biology Curriculum49 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
MATH1540 TRIGONOMETRY.....	3
-OR-	
MATH1520 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 Requirements30 SEM. HRS.

Outcome 1 - Critical Analysis

ENGL 1102 (Institutional Requirement)	3
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Outcome 2 - Quantitative Literacy

MATH 1540 OR 1510 (PR for MATH 1520).....	4
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Outcome 3 - Written Communication

ENGL 1101 (Institutional Requirement)	3
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Outcome 4 - Teamwork	
COMM 2201* or any other Outcome 4	3
Outcome 5 - Information Literacy	
EDUC 2201 (Satisfied in Major).....	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 course in Outcome 9	3
Outcome 10- Health	
EDUC 2203 (Satisfied in Major).....	X
Outcome 11- Interdisciplinary	
GEOG 2210* or any other course in Outcome 11.....	X
Outcome 12 - 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 course in Outcome 16	3
Additional General Studies hours	
CHEM 3301, 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.

CHEMISTRY

The mission of the Chemistry Program at Fairmont State is to help students learn chemistry, and how it connects to computers, mathematics, biology and physics. The program strives to foster excellent oral and written communication skills, and is approved by the American Chemical Society. With small class sizes, innovative teaching approaches, and hands-on access to modern, research-quality instrumentation, students can develop the analytical, problem-solving and teamwork skills necessary to successfully pursue science-based careers. A student completing the B.S. degree with a major in chemistry will be competitive for graduate study in chemistry or chemical engineering, laboratory positions in the chemical industry, pharmaceutical industry or government

agencies, or application to law school. By electing a few additional biology classes, students completing a B.S. degree in chemistry will be prepared for application to a variety of professional and graduate schools, including medical school, dental school, veterinary school, pharmacy school, physical therapy programs, toxicology, pharmaceutical science and forensic science graduate programs. Programs available for students who wish to specialize in chemistry include:

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

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
MATH1586 APPLIED CALCULUS II.....	*4
-OR-	
MATH2502 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 1540.

• 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
MATH1550 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 Requirements31 SEM. HRS.
 Professional Education Courses39 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
 MATH1585 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 Education39 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
 SOCY 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
 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 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)..... 39-41 SEM. HRS.
 Electives* 8-10SEM. HRS.
 No Minor Required

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

• Forensic Science Curriculum71 SEM. HRS.

Required Courses (63 hrs.)

BIOL 1106 BIOLOGICAL PRINCIPLES II.....	4
BIOL 3360 BIOCHEMISTRY	4
BIOL 3380 GENETICS	4
BIOL 3390 MOLECULAR BIOTECHNOLOGY	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
FORS 2201 INTRODUCTION TO FORENSIC SCIENCE	4
FORS 2225 FORENSIC MICROSCOPY AND SPECTROSCOPY.....	3
FORS 3200 FORENSIC BIOLOGY	4
FORS 3385 RESEARCH IN FORENSIC SCIENCE.....	3
FORS 4401 CAPSTONE SEMINAR IN FORENSIC SCIENCE.....	3
FORS 4411 FORENSIC SCIENCE INTERNSHIP	2
MATH1550 APPLIED STATISTICS.....	4

Specialization Electives Choose 8 hrs of the following:

BIOL 2224 MICROBIOLOGY.....	4
ANY BIOLOGY CLASS OF 3000 OR HIGHER.....	4
CHEM 3301 PHYSICAL CHEMISTRY I	4
CHEM 3304 INORGANIC CHEMISTRY I	4
CHEM 4404 SYNTHETICV METHODS AND MATERIALS	4
CHEM 4412 PHYSICAL CHEMISTRY II	4

• General Studies Requirements	39-41 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

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 Requirements30 SEM. HRS.
 (See "Degree Requirements" for General Studies requirements not completed through the major)
 Professional Education Courses39 SEM. HRS.
 Free Electives 4 SEM. HRS.

• General Science Curriculum48 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
 MATH1540 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 Requirements30 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 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 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
 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.)

PHYS* 1101/02 INTRODUCTION TO PHYSICS I, II.....	8
PHYS 3310 ELECTRICITY AND ELECTRONICS	4
PHYS 3325 ADVANCED PHYSICS I	4
PHYS 3335 ADVANCED PHYSICS II	4
PHYS 3340 SPECIAL PROBLEMS	2

MATH1585 APPLIED CALCULUS I.....	4
-OR-	
MATH2501 CALCULUS I.....	4
-OR-	
TECH 2290 ENGINEERING ANALYSIS I.....	4
MATH1586 APPLIED CALCULUS II.....	4
-OR-	
MATH2502 CALCULUS II.....	4
-OR-	
TECH 3300 ENGINEERING ANALYSIS II.....	4

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

BACHELOR OF ARTS IN EDUCATION:

SPECIALIZATION IN PHYSICS

GRADES 9-ADULT	120 SEM. HRS.
Physics Curriculum (see below)*	45-48 SEM. HRS.
General Studies Requirements	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
MATH2502 CALCULUS II.....	4
-OR-	
MATH1586 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 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

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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 has 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.

BACHELOR OF SCIENCE
IN COMPUTER SCIENCE..... 120 SEM. HRS.
Major Curriculum.....72-75 SEM. HRS.
General Studies Requirements35-36 SEM. HRS.
Free Electives 9-13 SEM. HRS.

• Major Curriculum 72-75 SEM. HRS.

Required Courses (55 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 2230 NETWORK PROGRAMMING 3
COMP 2270 DATA STRUCTURES 3
COMP 3330 ANALYSIS OF ALGORITHMS..... 3
COMP 3340 OPERATING SYSTEMS..... 3
COMP 3395 ETHICAL ISSUES IN COMPUTING..... 3
COMP 4400 AUTOMATA THEORY 3
COMP 4410 DATABASE MANAGEMENT 3
COMP 4440 SOFTWARE ENGINEERING 4
MATH1561 INTRODUCTION TO MATHEMATICAL REASONING 3
MATH2562 INTRODUCTION TO DISCRETE MATHEMATICS 3
MATH2501 CALCULUS I..... 4
MATH2502 CALCULUS II..... 4

Electives (9-10 HRS.)

(At least one COMP and at least one MATH course)

COMP 3300 COMPUTER GRAPHICS 3
COMP 3310 ARTIFICIAL INTELLIGENCE 3
COMP 3380 INTRODUCTION TO CRYPTOGRAPHY 3
COMP 4420 SELECTED ADVANCED TOPICS 3
COMP 4450 INTRODUCTION TO DATA MINING 3
MATH2510 MATHEMATICAL LOGIC 3
MATH3503 CALCULUS III..... 4
MATH3504 DIFFERENTIAL EQUATIONS..... 3
MATH3520 LINEAR ALGEBRA 3
MATH3540 NUMERICAL ANALYSIS..... 3
MATH3550 PROBABILITY AND STATISTICS..... 3

Science (8-10 HRS.)

BIO 1105 BIOLOGICAL PRINCIPLES I 4
BIO 1106 BIOLOGICAL PRINCIPLES II 4
CHEM 1105 CHEMICAL PRINCIPLES 5
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY..... 4
PHYS 1101 INTRODUCTION TO PHYSICS I..... 4
PHYS 1102 INTRODUCTION TO PHYSICS II..... 4
PHYS 1105 PRINCIPLES OF PHYSICS I..... 5
PHYS 1106 PRINCIPLES OF PHYSICS II..... 5

• General Studies Requirements 35-36 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.

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 4

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

MATH1561 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 AC-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 DESIGN26 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

MATHEMATICS

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	
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	(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 Requirements30-32 SEM. HRS.
(When choices are available, see the full General Studies Curriculum in Appendix A.)

Outcome 1 - Critical Analysis:

ENGL 1102 (Institutional Requirement)	3
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Outcome 2 - Quantitative Literacy:

MATH 1507 or 1407 or higher in Outcome 2 (Satisfied in Major)	X
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Outcome 3 - Written Communication:

ENGL 1101 (Institutional Requirement)	3
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Outcome 4 - Teamwork:

COMM 2200* or any course listed in Outcome 4	3
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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
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Outcome 7 - Oral Communication:

COMM 2200* (Met in Outcome 4) or any course in Outcome 7	X
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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 listed 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 MATHEMATICS24 SEM. HRS.

Required Courses (12 hrs.)

MATH2501 CALCULUS I	4
MATH2502 CALCULUS II.....	4
MATH3503 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).

MATH1550 APPLIED STATISTICS	3
MATH1561 INTRODUCTION TO MATHEMATICAL REASONING.....	3
MATH2510 MATHEMATICAL LOGIC.....	3
MATH2520 INTRODUCTION TO THE THEORY OF NUMBERS.....	3
MATH2562 INTRODUCTION TO DISCRETE MATHEMATICS	3
MATH2563 TRANSITION TO HIGHER MATHEMATICS	3
MATH3504 DIFFERENTIAL EQUATIONS	3
MATH3520 LINEAR ALGEBRA.....	3
MATH3540 NUMERICAL ANALYSIS	3
MATH3550 PROBABILITY I.....	3
MATH3570 MODERN GEOMETRY	3
MATH4520 ABSTRACT ALGEBRA	3

MATH4580 TOPOLOGY	3
MATH4590 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.)

MATH1550 APPLIED STATISTICS.....	3
MATH1561 INTRODUCTION TO MATHEMATICAL REASONING 3	
MATH2501 CALCULUS I.....	4
MATH2502 CALCULUS II.....	4
MATH2510 MATHEMATICAL LOGIC	3
MATH2554 TOPICS IN MATH HISTORY	2
MATH2562 INTRODUCTION TO DISCRETE MATHEMATICS	3
MATH2563 TRANSITION TO HIGHER MATHEMATICS	3
MATH3503 CALCULUS III.....	4
MATH3520 LINEAR ALGEBRA	3
MATH3550 PROBABILITY	3
MATH3570 MODERN GEOMETRY	3
MATH4520 ABSTRACT ALGEBRA.....	3
MATH4531 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.)

MATH4580 TOPOLOGY	3
MATH4590 REAL ANALYSIS	3

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

• Professional Education39 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 31-32 SEM. HRS.
(When choices are available, see the full General Studies Curriculum in Appendix A.)

Outcome 1 - Critical Analysis:

ENGL 1102 (Institutional Requirement).....	3
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Outcome 2 - Quantitative Literacy:

MATH 1507 or 1407 or higher in Outcome 2 (Satisfied in Major).....	X
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Outcome 3 - Written Communication:

ENGL 1101 (Institutional Requirement).....	3
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Outcome 4 - Teamwork:

COMM 2200* or any course listed in Outcome 4.....	3
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Outcome 5 - Information Literacy:

ENGL 1102* (Met in Outcome 1) or any course listed in Outcome 5 ...	
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Outcome 6 - Technology Literacy:

EDUC 2201* or any course in Outcome 6	(Satisfied in Major)
	3

Outcome 7 - Oral Communication:

COMM 2200* (Met in Outcome 4) or any course in Outcome 7	X
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Outcome 8 - Citizenship:

POLI 1100* or any course in Outcome 8	3
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Outcome 9 - Ethics:

ENGL 2220* or any course in Outcome 9	3
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Outcome 10- Health:

EDUC 2203* or any course in Outcome 10	(Satisfied in Major) 3
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Outcome 11- Interdisciplinary:

POLI 1100* (Met in Outcome 8) or any course in Outcome 11	X
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Outcome 12 - Arts:

Any course listed in Outcome 12.....	3
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Outcome 13 - Humanities:

ENGL 2220* (Met in Outcome 9) or any course listed in	
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Outcome 13	X
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Outcome 14 - Social Sciences:

GEOG 2210* or any course in Outcome 14.....	3
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Outcome 15 - Natural Science:

PHYS 1101, PHYS 1105, CHEM 1101, CHEM 1105, BIOL 1105, BIOL 1106, OR GEOL 1101 (Satisfied in Major)	4-5
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Outcome 16 - Cultural Awareness:

GEOG 2210* (Met in Outcome 14) or any course in Outcome 16.....	X
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Additional General Studies Hours:

MATH 4520 (WIC - Satisfied in Major).....	X
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* 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.
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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.)

MATH1530 or 1430 COLLEGE ALGEBRA*	3 or 4
MATH1540 TRIG. AND ELEMENTARY FUNCTIONS	3
MATH1550 APPLIED STATISTICS	3
MATH1561 INTRODUCTION TO MATHEMATICAL REASONING	3
MATH 2501 CALCULUS I.....	4
MATH2551 STRUCTURE OF THE REAL NUMBERS	3
MATH2552 DATA ANALYSIS AND GEOMETRY	3
MATH2554 TOPICS IN MATH HISTORY	2
MATH3553 MATH METHODS FOR ELEMENTARY TEACHERS	3
MATH4531 METHODS & MATERIALS IN TEACHING MATH.	3

*omit if Math ACT greater than or equal to 23

Department of Engineering Technology

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FACULTY

BOLYARD, JASON, P.E. (2007)
Assistant Professor of Mechanical Engineering Technology

CHAPMAN, ABBY (2016)
Assistant Professor of Occupational Safety

COMO, TIA M., P.E. (1998)
Professor of Architecture/Civil Engineering
Technology

COSTELLO, HUGH M., P.E. (2009)
Associate Professor of Mechanical
Engineering Technology

CRIHALMEANU, MUSAT, P.E. (2015)
Assistant Professor of Electronics
Engineering Technology

ELLIOTT, DENNIS (2016)
Assistant Professor of Aviation Technology
Chief Flight Instructor

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

KIRK, JOEL (2017)
Chief Flight Instructor

LAFFERRE, TABITHA (2016)
Assistant Professor of Engineering Technology

McLAUGHLIN, THOMAS (2014)
Assistant Professor of Electronics
Engineering Technology

TETER, DONALD (2018)
Assistant Professor of Surveying

TOSSONE, TREY (2016)
Assistant Professor of Occupational Safety

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

VOSBURGH, JASON (2015)
Assistant Professor of Aviation Technology

WOLF, MARK (2011)
Assistant Professor of Technology Education

ZICKEFOOSE, GARY, P.E. (1984)
Associate Professor of Civil 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 Requirements	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.
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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 INTERNSHIP	3
AVMA4498	UNDERGRADUATE RESEARCH	1-6

• General Studies Requirements 39-41 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 /	
PROFESSIONAL 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 INTERNSHIP	3
AVMA4498	UNDERGRADUATE RESEARCH.....	3

• General Studies Requirements39-42 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*	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 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.

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.)

AVMA2213 AIRPORT PLANNING AND DEVELOPMENT	3
AVMA3301 AVIATION HISTORY	3
AVMA3302 AVIATION LAW	3
AVMA3307 AVIATION SAFETY	3
AVMA4401 AVIATION INDUSTRY RESEARCH & ANALYSIS	3

MINOR IN AVIATION ADMINISTRATION

(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

MANAGEMENT120 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 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.

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.

CHEM 1105, 2200 CHEMICAL PRINCIPLES , FOUNDATIONAL BIOCHEMISTRY	9
ENGL 1101, 1102 WRITTEN ENGLISH I, II	6
MATH1540 TRIG. AND ELEMENTARY FUNCTIONS	3
MATH2501 CALCULUS I.....	4
MECH 1100 STATICS.....	3
PHED 1100 FITNESS AND WELLNESS	2
PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II.....	8
-OR-	
PHYS 1105, 1106 PRINCIPLES OF PHYSICS I, II.....	8
SOCIAL SCIENCE ELECTIVE.....	3
TECH 1108 ENGINEERING GRAPHICS I.....	3

CIVIL ENGINEERING TECHNOLOGY

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

ASSOCIATE OF SCIENCE IN

CIVIL ENGINEERING TECHNOLOGY

(ETAC of ABET Accredited) 60 SEM. HRS.

The Associate of Science degree in Civil Engineering Technology provides technical courses in the fundamentals of engineering, surveying, construction materials and methods, computer graphics, civil engineering graphics, construction estimating, structures, and environmental engineering technology. Most of the technical courses provide a combination of lecture and laboratory experiences. In addition, technical courses are underpinned with instruction in mathematics and science, written and oral communication skills, and economics, which are utilized subsequently in the technical courses.

Graduates with the Associate of Science degree are qualified for entry-level technical positions in construction, surveying, engineering and architectural firms; local, state and national government, environmental and public health agencies; state departments of transportation and highways; and private business industry.

Required Courses (41 hrs.)

CHEM 1101 GENERAL CHEMISTRY I.....	X
CIVL 1100 INTRODUCTION TO CIVIL ENGINEERING TECHNOLOGY	1
CIVL 2200 INTRODUCTION TO SURVEYING.....	3
CIVL 2210 LIGHT CONSTRUCTION	4
CIVL 2220 CONSTRUCTION MATERIALS AND METHODS.....	4
CIVL 2230 CONSTRUCTION ESTIMATING.....	3
CIVL 2240 LAND & ROUTE SURVEYING.....	3
CIVL 2275 CIVIL ENGINEERING GRAPHICS.....	3
CIVL 2280 ENVIRONMENTAL ENGINEERING TECH I.....	3
CIVL 2290 INTRODUCTION TO STRUCTURES.....	3
TECH 1108 ENGINEERING GRAPHICS.....	3
MATH1510 APPLIED TECHNICAL MATH I	X
MATH1520 APPLIED TECHNICAL MATH II	3
MECH 1100 STATICS.....	3
MECH 2200 STRENGTH OF MATERIALS	4
TECH 2290 ENGINEERING ANALYSIS I.....	4

• General Studies (19 hrs.)

Choose courses with advisor's approval.

BACHELOR OF SCIENCE IN ENGINEERING

TECHNOLOGY: CIVIL ENGINEERING TECHNOLOGY

(ETAC of ABET Accredited)..... 120 SEM. HRS.

Civil Engineering Technology Curriculum

(see below) 82 SEM. HRS.

General Studies Requirements 33-34 SEM. HRS.

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

Free Electives 1-2 SEM. HRS.

Technical Electives.....3 SEM. HRS.

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

Graduates with the Bachelor of Science degree are qualified for an entry-level position as a Civil Engineering Technologist in construction, surveying, engineering, and architectural firms; local, state, and national government, environmental and public health agencies; state departments of transportation and highways; and private business industry.

Baccalaureate graduates are eligible to sit for the Fundamentals of Engineering Exam (FE) in West Virginia, the first step to becoming a professional engineer.

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

Required Courses (82 hrs.)

CHEM 1101 GENERAL CHEMISTRY I	4
-OR-	
CHEM 1105 CHEMICAL PRINCIPLES	5
PHYS 1101 INTRODUCTION TO PHYSICS I.....	4
CHEM 1102 GENERAL CHEMISTRY II	4
-OR-	
CHEM 2200 FOUNDATIONAL BIOCHEMISTRY.....	4
CIVL 1100 INTRODUCTION TO CIVIL ENGINEERING TECH.	1
CIVL 2200 INTRODUCTION TO SURVEYING	3
CIVL 2210 LIGHT CONSTRUCTION	4
CIVL 2220 CONSTRUCTION MATERIALS	4
CIVL 2230 CONSTRUCTION ESTIMATING.....	3
CIVL 2240 LAND & ROUTE SURVEYING.....	3
CIVL 2275 CIVIL ENGINEERING GRAPHICS.....	3
CIVL 2280 ENVIRONMENTAL ENGINEERING TECH I	3
CIVL 2290 INTRODUCTION TO STRUCTURES	3
CIVL 3305 HYDRAULICS AND HYDROLOGY.....	3
CIVL 3340 SOIL MECHANICS.....	4
CIVL 4400 HIGHWAY DESIGN	4
CIVL 4410 ADVANCED STRUCTURAL ANALYSIS	3
CIVL 4420 CONSTRUCTION PLANNING & ADMIN.....	3
CIVL 4440 STRUCTURAL DESIGN	3
CIVL 4460 ENVIRONMENTAL ENGINEERING TECH II.....	3
CIVL 4470 ADVANCED SOILS AND FOUNDATION	3
MATH1510 APPLIED TECHNICAL MATHEMATICS I.....	X
MATH1520 APPLIED TECHNICAL MATHEMATICS II.....	3
MECH 1100 STATICS.....	X
MECH 2200 STRENGTH OF MATERIALS.....	4
MECH 3320 DYNAMICS.....	3
TECH 1108 ENGINEERING GRAPHICS.....	3
TECH 2290 ENGINEERING ANALYSIS I.....	4
TECH 3300 ENGINEERING ANALYSIS II.....	4

Free Elective (1-2 hrs.)

Choose a course with advisor's approval.

Technical Electives (3)

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

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

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

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

Required Major Courses (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
MATH1510	APPLIED TECHNICAL MATH I	3
MATH1520	APPLIED TECHNICAL MATH II	3

TECH 3300	ENGINEERING ANALYSIS II	4
PHYS 1101	INTRODUCTION TO PHYSICS I	4
PHYS 1102	INTRODUCTION TO PHYSICS II	4
TECH 2290	ENGINEERING ANALYSIS I	4

• Required General Studies Courses 14 SEM. HRS.

COMM 2202	INTRO. TO COMMUNICATION IN THE WORLD OR WORK	3
ENGL 1101	WRITTEN ENGLISH I	3
ENGL 1102	WRITEN ENGLISH II 3	
HEALTH ELECTIVE		2-3
TECH ELECTIVE		5-6

BACHELOR OF SCIENCE IN ENGINEERING

TECHNOLOGY: ELECTRONICS

ENGINEERING TECHNOLOGY

(ETAC of ABET Accredited) 120 SEM. HRS.

Electronics Engineering Technology

Curriculum (see below) 79 SEM. HRS.

General Studies Requirements 35-37 SEM. HRS.

(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	4
COMP 1110	INTRODUCTION TO PROGRAMMING	3
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 2270	MICROCOMPUTER SYSTEMS	3
ELEC 2280	PROGRAMMABLE CONTROLLERS	3
ELEC 3300	ADVANCED LINEAR ELECTRONICS	3
ELEC 3310	ADVANCED MICROCOMPUTER SYSTEMS	3
ELEC 3360	COMMUNICATION SYSTEMS	3
ELEC 4401	SENIOR ELECTRONICS PROJECT I	4
ELEC 4402	SENIOR ELECTRONICS PROJECT II	3
ELEC 4410	DATA ACQUISITION & CONTROL SYSTEMS	4
ELEC 4420	ADVANCED AUTOMATION CONTROLLERS	3
MATH 1510	APPLIED TECHNICAL MATH I	3
MATH 1520	APPLIED TECHNICAL MATH II	3
TECH 2290	ENGINEERING ANALYSIS I	4
TECH 3300	ENGINEERING ANALYSIS II	4
PHYS 1101	INTRODUCTION TO PHYSICS I	4
PHYS 1102	INTRODUCTION TO PHYSICS II	4

TECH Electives * (4-6 hrs. from the following list)

BISM 2400	OPERATING SYSTEMS CONCEPTS	3
BISM 2600	INTRO TO NETWORKING ADMINISTRATION	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
MANF2205	ENGINEERING ECONOMY	3
MATH2503	CALCULUS III	4
MATH3550	PROBABILITY & STATISTICS	3
MATH3520	LINEAR ALGEBRA	3
MATH3504	DIFFERENTIAL EQUATIONS	3
MECH 1100	STATICS	3
MECH 2200	STRENGTH OF MATERIALS	4
MECH 2210	THERMODYNAMICS I	3
MECH 2220	FLUID MECHANICS	3
MECH 2240	MACHINE DESIGN I	3
SFTY 2250	SAFETY LAW & COMPLIANCE	3
TECH 2208	ENGINEERING GRAPHICS II	3
TECH 4401	WORK EXPERIENCE LABORATORY	8

*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 TECHNOLOGY19 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 COLTROLLERS3	

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	Strength of Materials 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

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.

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

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
CIVL 2200 INTRODUCTION TO SURVEYING.....	3
CIVL 2210 LIGHT CONSTRUCTION	3
CIVL 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.....	4
MATH3550 PROBABILITY & STATISTICS.....	3
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 PLCS	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.
(when choices are available, see the full General Studies Curriculum in Appendix A.)

Outcome 1-Critical Analysis:

MECH 1100 (Satisfied in major).....	X
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Outcome 2-Quantitative Literacy:

MATH 1510 (PR for MATH 1520).....	3
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Outcome 3-Written Communications:

ENGL 1101 (Institutional Requirement).....	3
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Outcome 4-Teamwork:

MECH 4430 (Satisfied in Major).....	X
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Outcome 5-Information Literacy:

ENGL 1102 (Institutional Requirement).....	3
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Outcome 6-Technology Literacy:

TECH 1100* 3

Outcome 7-Oral Communications:

COMM 2200 or 2201 or 2202*	3
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Outcome 8-Citizenship:

HIST 1107 or 1108*.....	3
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Outcome 9-Ethics:

COMM 2200 or 2201 or 2202* (Satisfied in Outcome 7)	X
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Outcome 10-Health:

PHED 1100*	2
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Outcome 11-Interdisciplinary:

Any course listed in Outcome 11	3
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Outcome 12-Arts:

Any course in Outcome 12	3
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Outcome 13-Humanities:

HIST 1107 or 1108* (Satisfied in Outcome 8).....	X
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Outcome 14-Social Sciences:

BSBA 2200*	3
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Outcome 15-Natural Science:

PHYS 1101 (PR for PHYS 1102)	4
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Outcome 16-Cultural Awareness:

Any Course in Outcome 16	3
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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.)

BIOL 1180 & 1181 HUMAN ANATOMY & PHYSIOLOGY.....	4
CHEM 1101 GENERAL CHEMISTRY I.....	4
CHEM 1102 GENERAL CHEMISTRY II.....	4
COMM 2200 OR 2201 OR 2202.....	3
ENGL 1101 WRITTEN ENGLISH I.....	3
ENGL 1102 WRITTEN ENGLISH II.....	3
MATH1510 APPLIED TECHNICAL MATH I.....	3

MATH1520 APPLIED TECHNICAL MATH II.....	3
PHYS 1101 INTRODUCTION TO PHYSICS I.....	4
SCIE 1100 HUMAN BIOLOGY.....	4
SFTY 1100 SAFETY AND ENVIRONMENTAL COMP. OF INDUSTRY... 3	
SFTY 1150 SAFETY MANAGEMENT AND CONCEPTS IN ACCIDENT PREVENTION.....	3
SFTY 2250 SAFETY LAW AND COMPLIANCE.....	3
SFTY 2280 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.....	2

BACHELOR OF SCIENCE:

OCUPATIONAL 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.)

BIOL 1180 & 1181 Human Anatomy & Physiology.....	4
BSBA 3306 BUSINESS LAW I.....	3
CHEM 1102 GENERAL CHEMISTRY II.....	4
MANF2250 Total Quality & SPC.....	3
MATH1520 APPLIED TECHNICAL MATHEMATICS II.....	3
MATH1550 APPLIED STATISTICS.....	3
MECH 1100 STATICS.....	3
PHYS 1101 INTRODUCTION TO PHYSICS I.....	4
PHYS 1102 INTRODUCTION TO PHYSICS II.....	4
SCIE 1100 HUMAN BIOLOGY.....	4
SFTY 1100 SAFETY & ENVIRON. COMPONENTS OF INDUSTRY... ..	3
SFTY 1150 SAFETY MGT. & CONCEPTS IN ACCIDENT PREV.....	3
SFTY 2250 SAFETY LAW & COMPLIANCE.....	3
SFTY 2280 CONSTRUCTION SAFETY & LAW.....	3
SFTY 2290 INDUSTRIAL HYGIENE AND TOXICOLOGY.....	4
SFTY 2291 ENVIRONMENTAL ENGR. TECH.: HAZ. WASTE.....	4
SFTY 3300 INDUSTRIAL HYGIENE APPLICATIONS AND PRACTICES... 4	
SFTY 3310 ERGONOMICS & HUMAN FACTORS.....	3
SFTY 3355 AIR AND WATER POLLUTION.....	3
SFTY 3360 FIRE PREVENTION.....	3
SFTY 4415 SAFETY INTERNSHIP.....	3
SFTY 4400 SAFETY ENGINEERING DESIGN.....	3
SFTY 4420 SYSTEM SAFETY AND MANAGEMENT.....	3

SFTY 4480	APPLICATION OF SAFETY STRATEGIES.....	4
Electives (8 hrs.)		
BISM 2800	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
MANF1100	MATERIALS & PROCESSES.....	3
MANF2205	ENGINEERING ECONOMY.....	3
MATH1585	APPLIED CALCULUS I.....	4
MATH1586	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
SFTY 2210	DISASTER PREPAREDNESS	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 Requirements36 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 SAFETY23-24 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
MATH1550	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
MANF1100	MATERIALS AND PROCESSES	3
MANF2250	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

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FACULTY

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MORPHEW, KIRK L., AIA, NCARB, LEED AP
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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 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.)

ARCH 1000	DESIGN FUNDAMENTALS I	4
ARCH 1050	DESIGN FUNDAMENTALS II	4
ARCH 2000	DESIGN I: FOUNDATION	4
ARCH 2010	ARCHITECTURAL HISTORY I	3
ARCH 2020	ARCHITECTURAL HISTORY II	3
ARCH 2050	DESIGN II: FOUNDATION	4
ARCH 2060	BUILDING TECHNOLOGY I	4
MATH 1540	TRIGONOMETRY	3
MECH 1100	STATICS	3

• General Studies Outcomes (24 hrs.)

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	
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	

ART 1120*	3
Outcome 13 – Humanities	X
Outcome 14 - Social Sciences	X
Outcome 15 - Natural Sciences	
PHYS 1101 (Required by Major)	4
Outcome 16 - Cultural Awareness & Human Dignity	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.

• 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)

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 Curriculum71 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

ARCH 2020 ARCHITECTURAL HISTORY II	3
ARCH 2050 DESIGN II: FOUNDATION	4
ARCH 2060 BUILDING TECHNOLOGY I	4
ARCH 3000 DESIGN III: SITE	6
ARCH 3050 DESIGN IV: URBAN	6
ARCH 4000 DESIGN V: TECHNOLOGY	6
ARCH 4030 MECHANICAL AND ELECTRICAL SYSTEMS	4
ARCH 4050 DESIGN VI: DESIGN/BUILD	6
ARCH 4060 BUILDING TECHNOLOGY II	4
CIVL 2290 INTRODUCTION TO STRUCTURES	3
MATH 1540 TRIGONOMETRY	3
MECH 1100 STATICS	3
MECH 2200 STRENGTH OF MATERIALS	4

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

	[PR: ENGL 1102]	
ART 3378	ART HISTORY FROM 1750 TO 1950.....	3
	[PR: ENGL 1102]	
ART 3380	ART HISTORY SINCE 1950.....	3
	[PR: ENGL 1102]	
ART 3383	POTTERY I.....	2-3
ART 3384	POTTERY II.....	2-3
	[PR: ART 3383]	
ART 4445	E. ADVANCED	3
	[PR: ART 3345]	
ART 4464	POTTERY III.....	3
	[PR: ART 3384]	
ART 4465	SCULPTURE III	3
	[PR: ART 2284]	
BSBA 2204	PRINCIPLES OF MARKETING.....	3
BSBA 2209	PRINCIPLES OF MANAGEMENT	3
BSBA 3306	BUSINESS LAW I.....	3
CIVL 2200	INTRODUCTION TO SURVEYING.....	3
	[INSTRUCTOR PERMISSION]	
GRFX 1111	IMAGING I FOUNDATIONS	3
GRFX 1113	MULTIMEDIA CONCEPTS	3
GRFX 1220	MASTER DOCUMENT/DESIGN.....	3
	[PR: GRFX 1111]	
GRFX 1222	INTERNET ANIMATION.....	3
GRFX 2121	GRAPHIC DESIGN I FOUNDATIONS	3
	[PR: GRFX 1220]	
GRFX 2123	PHOTOGRAPHY I FOUNDATIONS	3
GRFX 2125	HISTORY OF GRAPHIC DESIGN	3
GRFX 2220	INFORMATION GRAPHICS.....	3
	[PR: GRFX 1111]	
GRFX 2222	TYPOGRAPHY I FOUNDATIONS.....	3
	[PR: GRFX 1220]	
GRFX 3131	MOTION GRAPHICS I.....	3
	[PR: GRFX 1222]	
GRFX 3133	TYPOGRAPHY II / BRANDING AND IDENTIFY DESIGN.....	3
	[PR: GRFX 2222]	
GRFX 3230	INTERACTIVE AND MULTIMEDIA DESIGN.....	3
	[PR: GRFX 1222]	

• General Studies Requirements36 SEM. HRS.
(When choices are available, see the full General Studies Curriculum in Appendix A.)

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-Multimedia 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.

Curriculum (see below)..... 73 SEM. HRS.
 General Studies Requirements 35-37 SEM. HRS.
 Free Electives 10-12 SEM. HRS.

Required Courses (73 hrs.)

ARCH 1000	DESIGN FUNDAMENTALS I	4
ART 1141	DESIGN II: 3D	3
ART 3380	ART HISTORY SINCE 1950	3
COMP 1110	INTRODUCTION TO PROGRAMMING	3
GRFX 1111	IMAGING I FOUNDATION	3
GRFX 1113	MULTIMEDIA CONCEPTS	3
GRFX 1220	MASTER DOCUMENT / DESIGN	3
GRFX 1222	INTERNET ANIMATION	3
GRFX 2121	GRAPHIC DESIGN I FOUNDATION	3
GRFX 2123	PHOTOGRAPHY I FOUNDATION	3
GRFX 2125	HISTORY OF GRAPHIC DESIGN	3
GRFX 2220	INFORMATION GRAPHICS	3
GRFX 2222	TYPOGRAPHY I FOUNDATION	3
GRFX 3131	MOTION GRAPHICS I	3
GRFX 3133	TYPOGRAPHY II / BRANDING AND IDENTITY DESIGN.....	3
GRFX 3230	INTERACTIVE AND MULTIMEDIA DESIGN	3
GRFX 3232	PHOTOGRAPHY II STUDIO & VIDEO TECH	3
GRFX 3234	MULTIPAGE DOCUMENTS AND DESIGN	3
GRFX 4141	GRAPHIC DESIGN SENIOR SEMINAR	3
GRFX 4143	MOTION GRAPHICS II	3
GRFX 4145	EXHIBITION DESIGN & DEVELOPMENT / SENIOR SHOW	3
GRFX 4240	GRAPHIC DESIGN APPLIED THEORY	3
GRFX 4242	CAREER AND PORTFOLIO DEVELOPMENT	3
GRFX 4244	SENIOR INTERNSHIP	3

• 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 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	Typography 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.)

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