The Bachelor of Applied Science in Scientific Technology Studies is designed to provide applicants, who have earned an Associate of Applied Science degree, the opportunity to continue their education in a field of science and to pursue a position in an industrial laboratory setting. A minimum of 39 hours of Upper Level course work is required, of which, at least 21 hours must be upper level chemistry courses. Thirty of these upper level hours must be completed at Dalton State.

**Area A: Essential Skills**
ENGL 1101 English Composition I 3
ENGL 1102 English Composition II 3
MATH 1111 College Algebra 3

**Area B: Institutional Options**
COMM 1110 3
One of the following electives: 1
COMM 1120 Argumentation and Advocacy
ENGL 1105 Intro to Greek Mythology
ENGL 1110 Creative Writing
GEOG 1000 Natural Hazards
HIST 1050 Appalachian Hist-Special Topic
HIST 1051 Sports Hist & Amer Character
HLTH 1030 Health and Wellness Concepts
HUMN 1000 Mystery Fiction in Pop Culture
HUMN 1100 Political and Social Rhetoric
HUMN 1300 Christian Fiction/Pop Culture
SOCI 1000 Race and Ethnicity in America
PRSP Elective (See advisor)

**Area C: Humanities/Fine Arts**
Choose one to two ENGL course(s): 3-6
ENGL 2000 Topics in Literature & Culture
ENGL 2111 World Literature I
ENGL 2112 World Literature II
ENGL 2120 British Literature I
ENGL 2121 British Literature II
ENGL 2130 American Literature I
ENGL 2131 American Literature II
ENGL 2201 Intro to Film as Literature
If one ENGL course chosen, add one of the following: 0-3
ARTS 1100 Art Appreciation
HUMN 1201 Expressions of Culture I
HUMN 1202 Expressions of Culture II
MUSC 1100 Music Appreciation
MUSC 1110 World Music
MUSC 1120 American Music
THEA 1100 Theatre Appreciation

**Area D: Science/Mathematics/Technology**
Select one of the following lab science sequences: 8
BIOL 1107K & BIOL 1108K Principles of Biology I and Principles of Biology II *
CHEM 1211K & CHEM 1212K Principles of Chemistry I and Principles of Chemistry II **
GEOL 1121K & GEOL 1122K Principles of Geology and Historical Geology
PHYS 1111K & PHYS 1112K Introductory Physics I and Introductory Physics II
PHYS 2211K & PHYS 2212K Principles of Physics I and Principles of Physics II
MATH 1113 Precalculus Mathematics 3

**Area E: Social Sciences**
HIST 2111 United States History to 1877 3
or HIST 2112 United States Hist since 1877
POLS 1101 American Government 3
Two of the following electives: 6
ANTH 1103 Intro to Cultural Anthropology
ECON 2105 Principles of Macroeconomics
ECON 2106 Principles of Microeconomics
GEOG 1100 Introduction to Geography
GEOG 1101 Intro to Human Geography
GEOG 1111 Intro to Physical Geography
HIST 1111 World Civilization to 1500 CE
HIST 1112 World Civilization since 1500
HIST 2111 United States History to 1877
HIST 2112 United States Hist since 1877
PHIL 1103 Intro to World Religions
PHIL 2010 Intro to Philosophical Issues
PHIL 2020 Logic and Critical Thinking
POLS 2101 Intro to Political Science
POLS 2201 State and Local Government
POLS 2301 Comparative Politics
POLS 2401 International Relations
PSYC 1101 Introduction to Psychology
PSYC 2101 Psychology of Adjustment
PSYC 2103 Human Development
SICI 1101 Introduction to Sociology
SOCI 1160 Social Problems

**Associate of Applied Science or Applied Technology degree**
Technology Credits ** 39

**Upper Level Academic Core**
CHEM 3211K Organic Chemistry I 4
CHEM 3212K Organic Chemistry II 4
CHEM 3311K Quantitative Analysis 4
CHEM 3312K Instrumental Methods of Analy s 4

**STM Electives**
Choose 23 hours from the following, at least 5 hours must be upper level chemistry: 23
BIOL 3150 Science and Society
BIOL 3550 Conservation Biology
BIOL 4275 Bioremediation/Phytoremediatio n
BIOL 4600 Ecotoxicology
BUS 3100 Survey of Business Law/Ethics
CHEM 3111K. Organic Chemistry I. 3-3-4 Units.
Introduces the chemistry of organic compounds including aliphatic and aromatic hydrocarbons, stereochemistry, monofunctional compounds and some polyfunctional compounds. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory. (F,S,M)
Prerequisites: CHEM 1212K.

CHEM 3212K. Organic Chemistry II. 3-3-4 Units.
Continues the exploration of the chemistry of organic compounds with an emphasis on the characteristics and reactions of a variety of functional groups. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory. (F,S,M)
Prerequisites: CHEM 1212K.

CHEM 3311K. Environmental Chemistry. 3-3-4 Units.
This course will cover the environmental chemistry involving the transport, distribution, reactions, and speciation of inorganic, organometallic and organic chemicals occurring in the air, soil and water environments at the local, national and global scale. Environmental transformations and degradation processes, toxicology, pollution and hazardous substances will be discussed. (S)
Prerequisites: CHEM 3211K.

CHEM 3411K. Physical Chemistry I. 3-3-4 Units.
A study of macromolecular phenomena in terms of micro molecular concepts including the gas state and thermodynamic. (F)
Prerequisites: CHEM 1212K and MATH 1113.

CHEM 3412K. Physical Chemistry II. 3-3-4 Units.
A continuation of CHEM 3411K including liquid and solid state, kinetics, and equilibria. (S)
Prerequisites: CHEM 1212K, MATH 2254, and PHYS 1112K or PHYS 2212K.

CHEM 3500. Biochemistry. 3-0-3 Units.
The chemical aspects of protein, carbohydrate, lipid, and nucleic acid, and enzyme function, bioenergetics, metabolism, photosynthesis, nucleic acid function, and protein biosynthesis. (S,M)
Prerequisites: BIOL 1107K and CHEM 3211K.

CHEM 3700K. Environmental Chemistry. 3-3-4 Units.
This course will cover the environmental chemistry involving the transport, distribution, reactions, and speciation of inorganic, organometallic and organic chemicals occurring in the air, soil and water environments at the local, national and global scale. Environmental transformations and degradation processes, toxicology, pollution and hazardous substances will be discussed. (S)
Prerequisites: CHEM 3211K.

CHEM 3900. Readings in Chemistry. 0-0-2 Units.
Independent in-depth study of the literature within a topic of current research in Chemistry. Approval of a faculty supervisor required before registration. (F, S)
Prerequisites: 12 hours of Chemistry and permission of the instructor.

CHEM 4000. Senior Seminar. 2-0-2 Units.
Survey of various topics, especially highlighting the interdisciplinary nature of chemistry. (S)
Prerequisites: 12 hours of upper level chemistry.

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tr>
<td>BUSA 3200</td>
<td>Survey of Economics</td>
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<td>BUSA 330</td>
<td>Survey of Accounting</td>
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<tr>
<td>CHEM 3500</td>
<td>Biochemistry</td>
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<td>CHEM 4800</td>
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<td>Internship in Chemistry</td>
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<td>CHEM 4900</td>
<td>Special Topics in Chemistry</td>
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Total Hours: 120

* BIOL 1107K and 1108K are prerequisites for the biology courses in the academic core.

** If CHEM 1211K and CHEM 1212K are not used for Area D they must be taken as part of the 39 hours of Technology Credits.

Courses

CHEM 1151K. Survey of Chemistry. 3-3-4 Units.
Introduces the fundamentals of chemistry including general principles of atomic structures, bonding, reactions, gases, water, solutions, pH and elementary organic chemistry and biochemistry. (S)
Prerequisites: MATH 1001, 1101, or 1111 and ENGL 0999 unless exempt.

CHEM 1211K. Principles of Chemistry I. 3-3-4 Units.
Explores the discipline of chemistry through an understanding of the basic laws and properties of matter, stoichiometry, atomic structure, chemical bonding, gas laws, solutions and the physical states of matter. Requires laboratory experimentation which illustrates applications of concepts studied in lecture. (F,S,M)
Prerequisites: MATH 1111 with a grade of "C" or better, ENGL 0999 unless exempt.

CHEM 1212K. Principles of Chemistry II. 3-3-4 Units.
Continues the exploration of the discipline of chemistry begun in CHEM 1211. Focuses on the more quantitative aspects of chemistry including chemical equilibria, kinetics, acid-base, solubility product, electrochemistry and coordination compounds. Requires laboratory development of techniques necessary to identify common metallic and non-metallic ions. (F,S,M)
Prerequisites: CHEM 1211K.

CHEM 2000. Scientific Communication. 2-0-2 Units.
An introduction to the principles of ethics in the chemical sciences. Also, the infrastructure of scientific scholarship is introduced with an emphasis on interaction with the scientific community, responsible conduct in research, and communication of scientific findings. (F)
Prerequisites: CHEM 1212K.

CHEM 3103. Textile Chemistry. 3-0-3 Units.
Assures a basic understanding of the properties and reactions of aliphatic and aromatic organic compounds. Emphasis will be placed on mechanistic interpretations and the development of synthetic schemes leading to polyfunctional compounds of the types encountered in the textile industry. (S, M)
Prerequisites: CHEM 1211K.

CHEM 3211K. Organic Chemistry I. 3-3-4 Units.
Introduces the chemistry of organic compounds including aliphatic and aromatic hydrocarbons, stereochemistry, monofunctional compounds and some polyfunctional compounds. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory. (F,S,M)
Prerequisites: CHEM 1212K.

CHEM 3212K. Organic Chemistry II. 3-3-4 Units.
Continues the exploration of the chemistry of organic compounds with an emphasis on the characteristics and reactions of a variety of functional groups. Requires the illustration of techniques for synthesis, separation, purification and identification of organic compounds in the laboratory. (F,S,M)
Prerequisites: CHEM 1212K.

CHEM 3311K. Quantitative Analysis. 3-4-4 Units.
Introduction to statistics. The use of spreadsheets. Principles and techniques of volumetric analysis. Concepts of chemical equilibria as applied to acid-base, precipitation, and complex ion reactions. Electrochemistry and potentiometry. Introduction to spectroscopy and chromatography. (F)
Prerequisites: CHEM 1212K and MATH 1113.

CHEM 3312K. Instrumental Methods of Analysis. 3-3-4 Units.
Theoretical principles and uses of modern instrumental methods covering: measurement theory, atomic spectroscopy, molecular spectroscopy, mass spectrometry, electrometry, electroanalysis and chromatographic separations. (S)
Prerequisites: CHEM 3311K.

CHEM 3411K. Physical Chemistry I. 3-3-4 Units.
A study of macromolecular phenomena in terms of micro molecular concepts including the gas state and thermodynamic. (F)
Prerequisites: CHEM 1212K, MATH 2254, PHYS 1112K or PHYS 2212K.

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This course will cover the environmental chemistry involving the transport, distribution, reactions, and speciation of inorganic, organometallic and organic chemicals occurring in the air, soil and water environments at the local, national and global scale. Environmental transformations and degradation processes, toxicology, pollution and hazardous substances will be discussed. (S)
Prerequisites: CHEM 3211K.

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Independent in-depth study of the literature within a topic of current research in Chemistry. Approval of a faculty supervisor required before registration. (F,S)
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Prerequisites: 12 hours of upper level chemistry.
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Assures a basic understanding of the properties and reactions of aliphatic and aromatic organic compounds. Emphasis will be placed on mechanistic interpretations and the development of synthetic schemes leading to polyfunctional compounds of the types encountered in the textile industry.
Prerequisites: CHEM 3212K.

CHEM 4110K. Advanced Inorganic Chemistry. 3-3-4 Units.
Advanced theories of bonding and structure in inorganic chemistry with emphasis on ligand field theory, bioinorganic chemistry, and organometallic chemistry(F)
Prerequisites: CHEM 3212K, CHEM 3311K.

CHEM 4420. Adv Organic Spectroscopy. 3-0-3 Units.
This course is intended to introduce the spectroscopic methods used in the modern determination of organic structures. This will primarily consist of the study of mass spectrometry (MS), infrared (IR) spectroscopy, and nuclear magnetic resonance (NMR) spectrometry. Some discussion will be devoted to instrumental methods, but the primary focus of the course will be acquiring skill in the interpretation of this spectral data. This course will include hands-on experience using instrumentation. (F) Prerequisites: CHEM 3212K

CHEM 4430. Advanced Organic Chemistry. 3-0-3 Units.
Advanced topics in organic chemistry. Such topics include biomolecules, stereochemistry, physical organic chemistry, and heterocycles(F)
Prerequisites: CHEM 3212K.

CHEM 4800. Service Learning in Chemistry. 0-0-1-4 Unit.
A lecture assistantship or laboratory assistantship within a chemistry course here at Dalton State. Repeatable for a maximum of 4 credit hours.
(F,S,M)
Prerequisites: Approval of both a faculty supervisor and department chair.

CHEM 4860. Internship in Chemistry. 0-0-1-4 Unit.
A supervised, credit-earning work experience of one academic semester with a previously approved business firm, private agency or government agency. Repeatable for a maximum of 4 credit hours. (F,S,M).
Prerequisites: Permission of department chair.

CHEM 4900. Special Topics in Chemistry. 0-0-1-4 Unit.
Advanced concepts in chemistry will be presented, the detailed content varying from year to year. Course may be repeated for credit when topic differs.(Offered as Needed)
Prerequisites: CHEM 3212K and additional 3 upper level Chemistry courses.

CHEM 4960. Research in Chemistry. 0-0-1-4 Unit.
Research project conducted by a student under guidance of a faculty member. Approval of a faculty supervisor required before registration. Variable 1-4 hours. Repeatable for a maximum of 4 hours.(F,S)
Prerequisites: 16 hours of Chemistry and permission of the instructor.