

SCIENCE



9th Grade

[8000] Biology

[8003] **Advanced Biology**

10th Grade

[8040] Chemistry

[8023] **Advanced Chemistry**

11th/12th Grade

[8060] Physics

[8095] **AP Physics I**

[8073] **AP Chemistry**

[8083] **AP Biology**

[8094] **AP Environmental Science**

[8096] **AP Physics II**

[8097] **AP Physics C: Mechanics**

[8098] **AP Physics C: Electricity**

[8100] Anatomy & Physiology

[8140] Aquatic Science

[8145] Environmental Systems

[8170] Astronomy

Select from on level or advanced courses

Each course has a semester A and B
Successful completion of each semester earns students .5 credits
The full year is 1 credit

Fundamentals & Sheltered course equivalents for Science require approval

Bolded courses = weighted credit

Science Graduation Credits Needed=4

Additional Science Options

The course options different from what is listed above are listed below by grade level offering. Please note prerequisites may apply in order to enroll in the course.

10th

[8010] Int Physics & Chemistry

11th

[8040] Chemistry

Any advanced level science once prerequisites are met

12th

Any advanced level science once prerequisites are met

Dual Credit Options for 11-12

[0940] TCC Biology

[0942] TCC Geology

CTE Science Options for 11-12

[0810] Anatomy & Physiology

[1116CT] Animal Science

[8120CT] Medical Micro biology

[8125CT] Pathophysiology [9430CT]

Forensic Science

[1836CT] Principles of Engineering



Endorsements

STEM

- Four credits in science by successfully completing chemistry, physics, and two additional science courses

MULTIDISCIPLINARY

- Four credits in each of the four foundation subject areas to include Chemistry and/or Physics and English IV or a comparable AP English course
- Four credits in Advanced Placement or Dual credit Science



Graduation Requirements

- Foundation Plan = 3 science credits
- Credits must include Biology and a Physical Science (Chemistry, Physics, or IPC)
- The third credit may be from any other combination of additional science credits.
- Foundation with Endorsement = 4 science credits (Foundation plus an additional science credit)



Honors Ranking:

Courses identified as ELAR by TEA under [Chapter 74](#) and [Chapter 112](#) and offered by MISD are calculated into the GPA for honors ranking (starting with Class of 2023).



BIOLOGY**Course Number: 8000****Placement: 9-12****Credits: 1****Prerequisite: None**

This course provides a general knowledge of the natural order of living organisms and their relationship with the environment. Areas of study will include cells, classification, body systems, evolution and ecology. Laboratory procedures, observation, measurement, classification, prediction, and reporting skills will be emphasized. The course has an EOC exam that is a graduation requirement.

ADVANCED BIOLOGY**Course Number: 8003****Placement: 9-12****Credits: 1****Prerequisite: None**

This course is designed for students who show an advanced aptitude toward science. Areas of study will include the essential elements and objectives of those in regular Biology I with greater depth and at a more accelerated rate. A greater emphasis will be placed on lab and the ability to evaluate, outline, organize, and report scientific information. Laboratory procedures, observation, measurement, classification, prediction, and reporting skills will be stressed. Strong math skills are important. The student should be proficient in reading and projects are required. The course has an EOC exam that is a graduation requirement and prepares students for taking AP Biology.

FUNDAMENTALS OF BIOLOGY**Course Number: 8400****Placement: 9-12****Credits: 1****Prerequisite: ARD Approval**

This course provides a general knowledge of the natural order of living organisms and their relationship with the environment. Areas of study will include the systems and ecology. Laboratory procedures, observation, measurement, classification, prediction, and reporting skills will be emphasized. Fundamentals of Biology teachers deliver instruction on proper interaction with peace officers in the spring semester. This course utilizes a modified curriculum for Biology.

PRACTICAL BIOLOGY**Course Number: 5410****Placement: 9-12****Credits: 1****Prerequisite: ARD Approval**

This course provides a practical level of biology related to the natural order of living organisms and their relationship with the environment. Areas of study will include the systems and ecology at a practical level. Laboratory procedures, observation, measurement, classification, prediction, and reporting skills will be emphasized. Practical Biology teachers deliver instruction on proper interaction with peace officers in the spring semester. This course utilizes an alternate curriculum for Biology.

INTEGRATED PHYSICS AND CHEMISTRY (IPC)**Course Number: 5420****Placement: 9-12****Credits: 1****Prerequisite: None**

Integrated Physics and Chemistry (IPC) is a study of the physical aspects of the world. Topics will include properties of matter, atomic structure, the periodic table, motion, energy, forces, work, machines and electricity. A large portion of this course will consist of laboratory and demonstrations. IPC does not count as an advanced science credit on the Distinguished Plan or towards a STEM endorsement. IPC should be completed prior to Chemistry and/or Physics. TEA recommendation: For students in grade 9 or 10.

FUNDAMENTALS OF INTEGRATED PHYSICS AND CHEMISTRY (IPC)**Course Number: 8410****Placement: 9-12****Credits: 1****Prerequisite: ARD Approval**

Integrated Physics and Chemistry (IP&C) is a study of the physical aspects of the world. Topics will include properties of matter, atomic structure, the periodic table, motion, energy, forces, work, machines and electricity. A large portion of this course will consist of laboratory and demonstrations. This course utilizes a modified curriculum for IPC.

PRACTICAL INTEGRATED PHYSICS AND CHEMISTRY (IPC)**Course Number: 5420****Placement: 9-12****Credits: 1****Prerequisite: ARD Approval**

This course provides a practical level of integrated physics and chemistry as related to physical aspects of the world. Topics will include properties of matter, atomic structure, the periodic table, motion, energy, forces, work, machines and electricity at a practical level. A large portion of this course will consist of laboratory and demonstrations. This course utilizes an alternate curriculum for IPC.

CHEMISTRY**Course Number: 8040****Placement: 10-12****Credits: 1****Prerequisite: One Credit of High School Science AND Algebra I Suggested Completion OR Concurrent Enrollment in a Second Year of Math.**

This course covers the fundamental concepts of physical chemistry. This is a college preparatory class for students planning to attend a 4-year college/university. Students will be required to use higher level thinking skills and math applications to solve problems related to the properties of elements, compounds and mixtures, atomic structure, chemical bonding, chemical equations and stoichiometry. TEA recommendation: For students in grades 10, 11, or 12.

ADVANCED CHEMISTRY**Course Number: 8023****Placement: 10-12****Credits: 1****Prerequisite: Biology OR Advanced Biology AND Algebra I****Suggested Completion OR Concurrent Enrollment in a Second Year of Math**

Advanced Chemistry is a rigorous science course that integrates advanced mathematical models to solve in depth science problems at an accelerated pace. Chemistry topics include: properties of elements, interpretation of the periodic table, acid-base concepts, naming chemical compounds, writing chemical formulas and equations, stoichiometry, thermochemistry, electrochemistry, and solution chemistry. Emphasis will be placed on the ability to evaluate, outline, organize, and report scientific information. Projects and extensive lab reports are required.

PHYSICS**Course Number: 8060****Placement: 10-12****Credits: 1****Prerequisite: One Credit of High School Science AND Algebra I****Suggested Completion OR Concurrent Enrollment in a Second Year of Math.**

This course is designed for students to conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include laws of motion; changes within physical systems and conservation of energy and momentum; forces; thermodynamics; characteristics and behavior of waves; and atomic, nuclear, and quantum physics.

ADVANCED PLACEMENT CHEMISTRY**Course Number: 8073****Placement: 11-12****Credits: 1****Prerequisite: Chemistry OR Advanced Chemistry Completion OR Concurrent Enrollment in Algebra II**

AP Chemistry is designed to be the equivalent of a first-year college general chemistry course. It is a rigorous and challenging course with special emphasis on applying mathematics to problem solving and as a means of expressing and modeling scientific inquiry. The course will provide an in-depth treatment of atomic structure, gas laws, thermodynamics, stoichiometry, kinetics, equilibria, oxidation-reduction and electrochemistry. This course targets the pre-professional student (i.e. engineering and health professions).

ADVANCED PLACEMENT PHYSICS I**Course Number: 8095****Placement: 10-12****Credits: 1****Prerequisite: Algebra I, Geometry, and Algebra II OR Concurrent Enrollment in Algebra II**

This algebra-based course is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; mechanical waves and sound. It will also introduce electric circuits.

ADVANCED PLACEMENT PHYSICS 2**Course Number: 8096****Placement: 11-12****Credits: 1****Prerequisite: Algebra I, Geometry, and Algebra II OR Concurrent Enrollment in Algebra II**

This algebra-based course is the equivalent to a second-semester college course in algebra-based physics. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; atomic and nuclear physics.

ADVANCED PLACEMENT PHYSICS C: MECHANICS**Course Number: 8097****Placement: 11-12****Credits: 1****Prerequisite: Completion of AP Physics 1 and Concurrent enrollment in Calculus**

Mechanics is a calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in one of the physical sciences or engineering. Students cultivate their understanding of physics through classroom study and activities as well as hands-on laboratory work as they explore concepts like change, force interactions, fields, and conservation with a more analytical approach than AP Physics 1. This course allows students to build your understanding and critical thinking skills through inquiry-based, laboratory investigations and explore these advanced physics concepts.

ADVANCED PLACEMENT PHYSICS C: ELECTRICITY and MAGNETISM**Course Number: 8098****Placement: 11-12****Credits: 1****Prerequisite: Completion of AP Physics I and Concurrent enrollment in Calculus**

Use a differential and integral calculus-based approach to solve problems associated with concepts such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Build your understanding and critical thinking skills through inquiry-based, laboratory investigations and explore these advanced physics concepts. This is a calculus-based advanced physics course appropriate for students planning to specialize or major in one of the physical sciences or engineering.

ADVANCED PLACEMENT BIOLOGY**Course Number: 8083****Placement: 10-12****Credits: 1****Preferred Prerequisite: Biology or Advanced Biology AND Chemistry or Advanced Chemistry**

This course provides students with an in-depth study of biochemistry, microbiology, natural selection and genetics at an accelerated pace. This course is primarily for students who are interested in a career in medicine, biology or other related fields. Students taking this course should be highly motivated and strong in critical thinking and independent study skills. Successful completion of AP Biology should prepare students for the Advanced Placement Examination and/or the second level college biology course.

ANIMAL SCIENCE**Course Number: 1116CT****Placement: 11-12****Credits: 1****Prerequisite: Small Animal Management OR Livestock OR Equine Science AND Biology AND One Additional Science**

This course will build on the skills learned in Animal Science. Students will learn disease management in domesticated animals including treatments such as vaccinations and medications. Emphasis in this course is placed on the interrelatedness of human, scientific, and technological dimensions of livestock productions. Note: This course can be used as 4th science credit for graduation if prerequisite requirements are met. This is an 18-week course.

TEA Recommendation: For students in grade 12.

FUNDAMENTALS OF ENVIRONMENTAL SYSTEMS**Course Number: 8420****Placement: 9-12****Credits: 1****Prerequisite: ARD Approval**

This course provides a general knowledge of ecological concepts and the environmental problems that affect the world in which they live. Students will learn about technological developments, which have created environmental problems, as well as technology that is helping to solve them. This program provides one way in which students can become more aware of the interaction of people and their environment. This course utilizes a modified curriculum for Environmental Systems.

ENVIRONMENTAL SYSTEMS**Course Number: 8145****Placement: 11-12****Credits: 1****Prerequisite: Biology AND One Physical Science (IPC, Chemistry or Physics)**

This course is designed to introduce students to major ecological concepts and the environmental problems that affect the world in which they live. Students will learn about technological developments, which have created environmental problems, as well as technology that is helping to solve them. This program provides one way in which students can become more aware of the interaction of people and their environment. Laboratory and fieldwork will be afforded to enhance learning.

ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE**Course Number: 8094****Placement: 11-12****Credits: 1****Prerequisite: Biology AND One Credit Physical Science (IPC, Chemistry, or Physics)**

This course is designed to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study and includes indoor and outdoor investigations/activities.

AQUATIC SCIENCE**Course Number: 8140****Placement: 11-12****Credits: 1****Prerequisite: Biology and One Physical Science (IPC, Chemistry or Physics)**

In this course, students conduct field and laboratory investigations, use scientific methods during investigations, work collaboratively and make informed decisions using critical thinking and scientific problem solving. This course focuses on the physical and biological characteristics of the earth's freshwater and marine ecosystems. Topics include the properties of water, water's effect on climate, how water shapes the earth, aquatic ecosystems, environmental issues related to freshwater systems and oceans, technology used in aquatic field studies, and organism adaptations to aquatic ecosystems. TEA Recommendation: For students in grades 11 or 12.

ASTRONOMY**Course Number: 8170****Placement: 11-12****Credits: 1****Prerequisite: Biology and One Physical Science (IPC, Chemistry or Physics)**

In this course, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study the following topics: information about the universe; scientific theories of the evolution of the universe; characteristics and the life cycle of stars; exploration of the universe; role of the Sun in our solar system; planets; and the orientation and placement of the Earth. TEA Recommendation: For students in grades 11 or 12.

FUNDAMENTALS OF ASTRONOMY**Course Number: 8470****Placement: 11-12****Credits: 1****Prerequisite: One Credit of High School Science**

This course provides a general knowledge of astronomy. In this course, students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study the following topics: information about the universe; scientific theories of the evolution of the universe; characteristics and the life cycle of stars; exploration of the universe; role of the Sun in our solar system; planets; and the orientation and placement of the Earth. This course utilizes a modified for Astronomy. TEA Recommendation: For students in grades 11 or 12.

ANATOMY AND PHYSIOLOGY OF HUMAN SYSTEMS**Course Number: 8100/0810CT****Placement: 11-12****Credits: 1****Prerequisite: Biology AND Chemistry AND Physics OR Any Intro Level Health Science Course**

Students will study the structures and functions of the human body systems. Students will do a comparative study of mammals with an in-depth dissection of a mammal. Human development, maintenance of homeostasis, transport systems and energy processes will also be topics of study. As part of the laboratory investigative process, students will be active in the dissection of prepared specimens.

MEDICAL MICROBIOLOGY**Course Number: 8120CT****Placement: 10-12****Credits: 1****Prerequisite: Biology AND Chemistry AND a 3rd Science Course OR Any Intro Health Science Course**

Students will study the relationships of microorganisms to wellness and disease. Students will develop knowledge and skills related to disease prevention by learning the chain of infection, asepsis, and standard precautions. Pathogenic and nonpathogenic organisms will be identified to assist in the understanding of specific diseases, causative agents, and treatment options. Students are encouraged to participate in Health Occupations Students of America (HOSA), a co-curricular youth organization. The classroom portion of this course will be taught at the Ben Barber campus.

PATHOPHYSIOLOGY**Course Number: 8125CT****Placement: 11-12****Credits: 1****Prerequisite: Biology AND Chemistry AND a 3rd Science Course OR Any Intro Health Science**

Students will study disease processes, and how human systems are affected. Emphasis is placed on prevention and treatment of diseases. Students will differentiate between normal and abnormal physiology. Students are encouraged to participate in Health Occupations Students of America (HOSA), a co-curricular youth organization. The classroom portion of this course will be taught at the Ben Barber campus. This is an 18-week course.

FORENSIC SCIENCE**Course Number: 9430CT****Placement: 11-12****Credits: 1****Prerequisite: Forensic Psychology AND Biology AND Chemistry**

This course uses a structured and scientific approach to the investigation of crimes of assault, abuse and neglect, domestic violence, accidental death, homicide and the psychology of criminal behavior. Student will learn terminology and investigative procedures related to crime scene, questioning, interviewing, criminal behavior characteristics, truth detection and scientific procedures used to solve crimes. Using scientific methods, students will collect and analyze evidence through case studies, simulated crime scenes and laboratory applications such as fingerprint analysis, ballistics, blood spatter analysis and DNA. Students will learn the history, legal aspects, and career options for forensic science. The classroom portion of this course will be taught at the Ben Barber campus.

PRINCIPALS OF ENGINEERING/ENGINEERING SCIENCE (PLTW)**Course Number: 1836CT****Placement: 11-12****Credit: 1****Prerequisite: Intro to Engineering AND Algebra I AND Biology AND Chemistry or IPC**

This course is designed to help students understand the field of engineering/engineering technology by exploring various technology systems and manufacturing processes. The activities and projects offered through this course are designed to help students learn how engineers and technicians use math, science, and technology in an engineering problem solving process. This course allows students the opportunity to earn transcripted college credit or to articulate college credit hours upon high school graduation through participating college/university Tech Prep programs. This is a Project Lead the Way course. Note: Course can be used as an additional science credit for graduation.

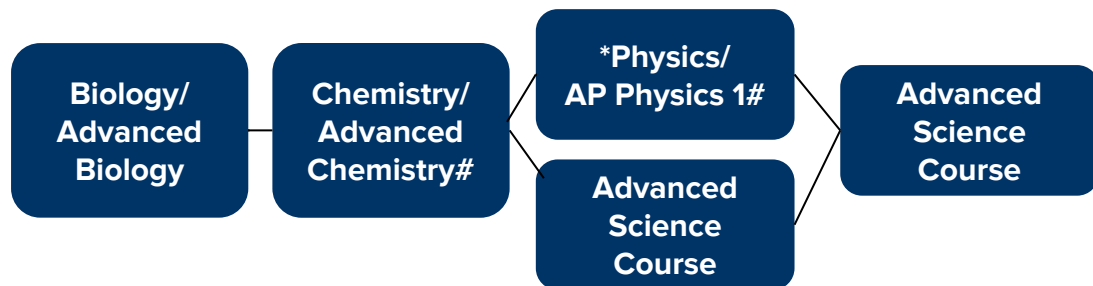
(TCC) BIOLOGY**Course Number: 0940****Placement: 12****Credits: 2****Prerequisite: 80+ Overall GPA & TSI Assessment**

TCC corresponding college credit: BIOL 1408 – General College Biology I (4 semester hours) BIOL 1409 – General College Biology II (4 semester hours). This is a regular college-level introductory biology course for the non-science major in which dual credit will be awarded. Students may receive up to 8 hours of college credit and one credit for each semester, successfully completed. Students will attend TCC classes on their home campus. This course meets the fourth-year science high school graduation requirement. **The TSI Assessment must be taken before students will be allowed to enroll in TCC classes.**

(TCC) GEOLOGY**Course Number: 0942****Placement: 11-12****Credits: 1****Prerequisite: 80+ Overall GPA & TSI Assessment**

TCC corresponding college credit: GEOL 1401 – Earth Sciences (4 semester hours). Survey of physical and historical geology, astronomy, meteorology, oceanography and related sciences. Students will attend this course at BBCTA after the traditional day ends or during the summer and are responsible for their own means of transportation. This course meets the fourth year science high school graduation requirement. **The TSI Assessment must be taken before students will be allowed to enroll in TCC classes.**

SUGGESTED COLLEGE READINESS SCIENCE PATHWAY



Science STEM Endorsement

For a STEM endorsement specific to science - students need 5 credits. Including Biology, Chemistry and Physics

^ interest in medical careers
 + interest in engineering
 # strong math skills needed

Advanced Science Course Options

Aquatics

Anatomy & Physiology[^]

Environmental Systems

AP Environmental Science

AP Physics I, II
 AP Physics C: M, E&M^{+ #}

AP Chemistry^{^ #}

AP Biology^{^ #}

Astronomy

TCC Dual Credit Science Option

CTE Course Option

TCC Dual Science Courses:

TCC Biology
 TCC Geology

CTE Courses Eligible for Science Credit

- Advanced Animal Science
- Medical MicroBiology
- Pathophysiology
- Forensic Science
- Principles of Engineering