Course Descriptions

Science Department

HHS Science department stands out for quality instruction, active group collaboration, and constructive feedback, who emphasize hands-on lab and real-world experiences to deepen students' understanding of classroom concepts. We have a diverse set of backgrounds with expertise from Bachelor to Doctoral level educational knowledge.

Course Offerings in Science

Students are required to earn three (3) science credits, which must include Biology, Chemistry or Physics, and third (3rd) lab-based science course.

Science Course Sequences

Level I	Level II	Level III
Biology I	Chemistry I Environmental Science Human Anatomy & Physiology Honors Physics I	Anatomy & Physiology I DE Anatomy & Physiology II DE Biology II Honors *AND* Biology AP Bio DE I Bio DE II Chemistry I Chemistry II Honors *AND* Chemistry AP Chem DE I Chem DE II Environmental Science Environmental Science AP Human Anatomy & Physiology Honors Physics I
Biology I Honors	Chemistry I Honors Human Anatomy & Physiology Honors Physics I	Anatomy & Physiology I DE Anatomy & Physiology II DE Biology II Honors *AND* Biology AP Bio DE I Bio DE II Chemistry II Honors *AND* Chemistry AP Chem DE I Chem DE II Environmental Science AP Physics I AP Physics II AP

.5 Credit Course

Course Offerings in Science

Physical Science

Physical Science is a foundational course aligned to Tennessee standards that explores matter, energy, motion, forces, and basic chemical interactions through scientific inquiry. The course serves as an introduction to concepts and skills that prepare students for future biology and chemistry coursework.

Credits: 1.0	Grade Level: 9 (select students only)
Prerequisite: None	

Biology I

Biology I consists of classroom and appropriate laboratory experiences studying living organisms and their vital processes. The concepts that will be covered in this course include laboratory skills, ecology, natural selection, biochemistry, cellular respiration, photosynthesis, cellular processes, and genetics.

Credits: 1.0	Grade Level: 9-10
Prerequisite: None	

Biology I Honors

Biology I Honors is designed to accentuate the thought processes and enhance the scientific competencies of each student enrolled so that he/she can fully develop to his/her maximum potential. It is designed for students who are motivated, very organized and excel in their cognitive abilities. Students should be able to synthesize and analyze material, predict and infer, and evaluate data. Topics covered are cytology, microbiology, genetics, photosynthesis, cellular respiration, nucleic acids and protein synthesis, zoology and botany. This course is a required prerequisite for Biology AP.

Credits: 1.0	Grade Level: 9-10
Prerequisite: Teacher recommendation; Memo of understanding	

Environmental Science

Environmental Science is a laboratory science course that enables students to develop an understanding of natural and man-made environments and environmental problems facing the world. Students explore environmental science concepts through an inquiry-based approach. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for Earth Systems, The Living World, Human Population, Water and Land Resources, Energy Resources and Consumption, Pollution and Waste Production, Global Change, and Civic Responsibility.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of or Concurrent Enrollment in Algebra I	

Chemistry I

Chemistry I follows a logical, sequential development of major chemical principles including atomic structure, matter and energy, bonding, mole concept, compound and molecular formation, acid-base chemistry, gas laws and stoichiometry.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Biology I; Completion of or Concurrent Enrollment in Geometry	

Chemistry I Honors

Chemistry I Honors is an advanced course designed for students who have an interest in the field of chemistry and has a strong mathematical and laboratory emphasis. The course is rigorous and fast paced. Some topics will require

independent study. Topics of study for this course include atomic structure, mole concept, periodic trends, bonding, chemical reactions, stoichiometry, gas laws, solutions and basic nuclear chemistry.

Chemistry I Honors requires an advanced understanding of algebraic principles and scientific reasoning to be successful. Students who enroll in this course should have attained a minimum of a C in Algebra I.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Biology I Honors; Completion of or Concurrent Enrollment in Geometry Honors; Teacher Recommendation; Memo of Understanding	

Human Anatomy & Physiology Honors

Human Anatomy and Physiology provides students an opportunity to explore the intricate and sophisticated relationship between structure (Anatomy) and function (Physiology) in the human body. These two sciences together provide a solid foundation upon which to build an understanding of how the human body works as a living organism. Lab includes observations, demonstrations, animal dissections, and experiments designed to enhance the understanding of topics covered in the course. This course is taught with an aim to help students understand how their body works and to help them decide if they might be interested in pursuing a career in science.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Biology I	

Physics I

Physics is the study of the world around us and the laws of nature, which seeks to explain why certain phenomena occur in nature and use that understanding to predict outcomes in various situations. It is often considered the basis for all sciences. In Physics I, students will learn concepts typically covered in the first half of an introductory physics course. Students will spend most of the course exploring the motion of objects and how or why an object changes its motion. Students will also explore concepts related to heat and temperature. Major topics include an introduction to motion (kinematics), vectors, force (dynamics), work, energy, momentum, circular motion, universal gravitation, heat, thermal energy, machine efficiency, and power sources. This course takes a conceptual and mathematical approach to topics requiring students to apply scientific practices and processes and to explore physics concepts through frequent labs and projects. Upon completion of this course, students will be prepared to take additional upper-level science courses at the high school level or have a foundation in physics in preparation for collegiate-level courses.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of Biology I; Completion of or Concurrent Enrollment in Algebra II	

Physics I AP - *EPSO*

Physics I AP: Algebra-Based is the equivalent to a first-semester college course in algebra-based physics. The course covers kinematics (1D and 2D motion), dynamics (force), circular motion, torque and rotational motion, energy, momentum, harmonic motion, and fluids. Students will have significant time for hands-on explorations of physics content and inquiry labs. Students should expect difficulty, time required, and independent learning indicative of a college-level course; expectations are above and beyond a typical honors course. Students who complete this course should be well prepared to navigate the increased demand and the academic expectations of college coursework. Students will be expected to use models to represent and analyze scenarios; use mathematical techniques to solve complex problems; plan, describe, and implement experimental procedures to address a given question; analyze data to create and support a conclusion; connect content, theories, and relationships across multiple topics to form appropriate questions, predictions, arguments, and conclusions. Upon completion of this course, students should be prepared to take additional upper-level science courses at the high school level, take the AP Exam in this course which may translate to college credit, and/or have a foundation in physics in preparation for collegiate-level courses. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination.

Credits: 1.0	Grade Level: 10-12
Prerequisite: Completion of or Concurrent Enrollment in Chemistry I Honors and Pre-Calculus AP or College Algebra DE & Trigonometry DE; Teacher Recommendation; Memo of Understanding; AP Exam Fee; Completion of AP exam	

Physics II AP – *EPSO*

Physics II AP is an Algebra-Based physics, which is equivalent to a second-semester college course. This is a continuation of the curriculum from Physics I AP, which covers thermodynamics, electrostatics, circuits, magnetism, waves, sound, optics, and an introduction to modern physics. This course allows students to opportunity gain and apply in-depth content knowledge including significant time for hands-on explorations of physics content and inquiry labs. Students will be expected to use models to represent and analyze scenarios; use mathematical techniques to solve complex problems; plan, describe, and implement experimental procedures to address a given question; analyze data to create and support a conclusion; connect content, theories, and relationships across multiple topics to form appropriate questions, predictions, arguments, and conclusions. Students should expect rigor and the time and independent learning requirements indicative of a college-level course as the needs and expectations necessary to succeed outpace those of a typical honors course. Students who complete this course should be well prepared to navigate the increased demand and the academic expectations of college coursework. Upon completion of this course, students should be prepared to take additional upper-level science courses at the high school level, take the AP Exam in this course which may translate to college credit, and/or have a foundation in physics in preparation for collegiate-level courses. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Physics I AP and Pre-Calculus AP or College Algebra DE & Trigonometry DE; Teacher Recommendation; Memo of Understanding; AP Exam Fee; Completion of AP exam	

Environmental Science AP - *EPSO*

Environmental Science AP is a course where students can cultivate their understanding of the interrelationships of the natural world through inquiry-based lab investigations and field work. Students will explore topics in energy transfer, interactions between earth systems, interactions between different species and the environment, and sustainability. This course will challenge students to identify and analyze current environmental issues and identify alternative solutions to solve these problems. Environmental Science AP is an interdisciplinary science incorporating geology, biology, environmental studies, chemistry, and geography. This is an introductory science college level course and is taught with equitable rigor and expectations. A final qualifying examination is required, and all students enrolled in the course must pay the fee for this examination. Receiving a certain score on the Advanced Placement exam may earn the student college credit.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion Biology I and Chemistry I; Completion of or Concurrent Enrollment in Pre-Calculus AP or College Algebra DE & Trigonometry DE; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP Exam Fee; Completion of AP exam	

Biology II Honors

Biology II Honors is an introduction to Biology AP, focusing on skills embedded in college-level science courses. High priority is placed on critical thinking skills by studying real world problems. Curriculum topics are examined with greater depth and include more advanced resource materials in addition to the textbook. Skills include analytical reading and writing, statistical and mathematical calculations, modeling relationships in biological systems and advanced experimental design.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Biology I Honors	
Special Note: Biology II Honors is the introduction to Biology AP. Students must enroll in Biology II Honors in the fall and Biology AP in the spring.	

Biology AP - *EPSO*

The Biology AP course is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion Biology I and Chemistry I; Completion of or Concurrent Enrollment in Algebra II; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP Exam Fee; Completion of AP exam	
Special Note: Biology II Honors is the introduction to Biology AP. Students must enroll in Biology II Honors in the fall and Biology AP in the spring.	

Bio DE I: Biology of Cells - *EPSO*

Bio DE I: Biology of Cells is the first course in the companion course, which includes 3 hours of lecture and 1 hour of LAB per semester. The course curricula includes a general overview of life with an emphasis on structure and function of organisms and the biosphere. Lab work is designed to explore the principles from lecture through experimentation, observation, and demonstration while applying the scientific method. If there are questions about credit transfer, students should inquire with the universities/colleges of their choice. Note: credit will not apply toward a major or minor in the sciences. BIOL 1010/11 & BIOL 1020/21 are companion courses, but it is not required for students to take both. UofM Course: BIOL 1010 & BIOL 1011

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Biology I and Chemistry I Honors; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Bio DE II: Biology of Organisms- *EPSO*

Bio DE II: Biology of Organisms is the second course in the companion course, which includes 3 hours of lecture and 1 hour of LAB per semester. The course curricula includes a general overview of life; emphasis on structure and function of organisms and biosphere. Lab work is designed to explore the principles from lecture through experimentation, observation, and demonstration while applying the scientific method. If there are questions about credit transfer, students should inquire with the universities/colleges of their choice. Note: credit will not apply toward a major or minor in the sciences. BIOL 1010/11 & BIOL 1020/21 are companion courses, but it is not required for students to take both. UofM Course: BIOL 1020 & BIOL 1021.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Bio DE I: Biology of Cells; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Chemistry II Honors

Chemistry II Honors enables students to develop a deep conceptual understanding of matter and energy at the molecular level as they learn to explain their macroscopic observations using particulate-level reasoning. Students will utilize scientific reasoning skills needed to analyze the natural world and to succeed in future science courses. Chemistry II Honors covers the following four main units: Structure and Properties of Matter, Chemical Bonding and Interactions, Chemical Quantities, and Chemical Transformations. This course will be taught with an emphasis on hands-on laboratory investigations and integration of technology to prepare students for taking Advanced Placement Chemistry.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Chemistry I Honors	
Special Note: Chemistry II Honors is the introduction to Chemistry AP. Students must enroll in Chemistry II Honors in the fall and Chemistry AP in the spring.	

Chemistry AP - *EPSO*

The Chemistry AP course provides students with a college-level foundation to support future advanced coursework in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore content such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. The Chemistry AP course is designed to be the equivalent of the general chemistry course usually taken during the first college year. This course requires that 25 percent of instructional time engages students in lab investigations. This includes a minimum of 16 hands-on labs (at least 6 of which are inquiry-based). Students are required to keep a lab notebook throughout the course.

Students will be able to make use of scientific and critical thinking necessary to analyze data, make use of scientific models and experimental methods to recognize connections and develop arguments and evaluate scientific explanations and theories. Additionally, students should be well prepared to successfully engage in the aligned AP exam, which can translate to collegiate credit.

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion Biology I and Chemistry I; Teacher Recommendation; Memo of Understanding; Summer Enrichment Statement; AP Exam Fee; Completion of AP exam	
Special Note: Chemistry II Honors is the introduction to Chemistry AP. Students must enroll in Chemistry II Honors in the fall and Chemistry AP in the spring.	

Chem DE I: Chemistry of Materials - *EPSO*

Chem DE I: Chemistry of Materials satisfies a General Education Natural Science requirement for students majoring in social sciences, humanities, fine arts, business, and education. The course concepts include: measurement and the scientific method; states of matter; fundamental laws of chemistry; modern atomic theory; water and aqueous solutions; oxidation-reduction and acid-base reactions; nuclear chemistry; energy and materials in modern society; environmental impact and sustainability. CHEM 1010/11 & CHEM 1110/11 are companion courses, but it is not required for students to take both. UofM Courses: CHEM 1010 & CHEM 1011

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Biology I and Chemistry I; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Chem DE II: General Chemistry - *EPSO*

Chem DE II: General Chemistry is the companion course of Chem DE I: Chemistry of Materials. The course concepts include: laws of chemistry; periodic table and chemical periodicity. stoichiometry, nomenclature. modern atomic theory and bonding; ionic and molecular compounds; molecular geometry; oxidation-reduction reactions; solutions and heterogeneous mixtures; gaseous state; states of matter and intermolecular forces; thermochemistry. Three lecture hours per week. CHEM 1010/11 & CHEM 1110/11 are companion courses, but it is not required for students to take both. UofM Courses: CHEM 1110 & CHEM 1111

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Chem DE I: Chemistry of Materials; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement; The successful completion of both semesters is required to fulfill substitution for Graduation Requirements	

Anatomy & Physiology I DE - *EPSO*

Anatomy & Physiology I DE introduces students to the fundamental principles of human anatomy and physiology, covering cell biology, tissues, and the structure and function of key body systems. Emphasis is placed on anatomical terminology, morphology, and physiological processes of the integumentary, skeletal, muscular, and nervous systems. Students will engage in case studies, virtual and physical labs, and dissections to deepen their understanding. This course is ideal for students pursuing careers in nursing, medicine, physical therapy, and related fields. These courses (BIOL 2010 and BIOL 2020) are prerequisite courses for many science fields, including nursing, medicine, physical therapy, radiology, and exercise medicine and science. BIOL 2010/11 & BIOL 2020/21 are companion courses, but it is not required for students to take both. UofM Course: BIOL 2010 & BIOL 2011

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Biology I; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement	

Anatomy & Physiology II DE - *EPSO*

Building on Anatomy & Physiology I, Anatomy & Physiology II DE explores the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Students will analyze case studies, perform dissections, and construct models to understand disease pathology and system interactions. A strong commitment to mastering complex vocabulary and physiological processes is required. This course is designed for students preparing for careers in healthcare and clinical sciences. These courses (BIOL 2010 and BIOL 2020) are prerequisite courses for many science fields, including nursing, medicine, physical therapy, radiology, and exercise medicine and science. BIOL 2010/11 & BIOL 2020/21 are companion courses, but it is not required for students to take both. UofM Course: BIOL 2020 & BIOL 2021

Credits: 1.0	Grade Level: 11-12
Prerequisite: Completion of Anatomy & Physiology I DE; Teacher Recommendation; Admission to UofM; ACT composite 19+; Math sub score of 18+; 100 admissions index score; DE agreement	