

SCIENCE

220011-220012 Earth and Space Science

Grade: 9 **Credit:** .5 semester **Term(s):** 1 or 2

In Earth and Space, you will learn and explore the interrelationships between the earth, air, space, life, and water. You will learn using a combination of lab investigations, modeling, reading, and data interpretation. This course also focuses on the practices of science and engineering as well as learning several concepts scientists use to discover new ideas and explanations. Topics include Earth's water and its atmosphere, the process and geology and Earth's history, human impact on the environment, and space science. This course prepares students to be scientifically literate as well as prepare them for future courses in biology and other science classes. Earth and Space Science is a required course for graduation.

221101-221102 Biology

Grade(s): 10-12 **Credit:** .5 per semester **Term(s):** 1 & 2

AEO

Biology is a course designed to teach the structure and function of living organisms then apply that knowledge to understand how organisms interact within larger systems. The major purpose of this course is to provide students with a basic understanding of biological concepts including: life's chemicals, interaction of cells to sustain life, ecology, heredity and the inheritance of traits, and evolution and diversity. Students will develop an understanding of these concepts through scientific laboratory investigations (including dissection of a fetal pig), hands-on activities, group work, individual work and projects. Biology is a required course for graduation in Minnesota

221901-221902 Honors Biology

Prerequisite: Commitment Agreement required

Grade(s): 10-12 **Credit:** .5 per semester **Term(s):** 1 & 2

Biology is a course designed to teach the structure and function of living organisms then apply that knowledge to understand how organisms interact within larger systems. The major purpose of this course is to provide students with a basic understanding of biological concepts including: scientific method, ecology, cells, genetics, evolution, body systems, and the impact of humans on our planet. Students will develop an understanding of these concepts through scientific laboratory investigations (including dissection of a fetal pig), hands-on activities, group work, individual work and projects. Honors Biology uses an AP level textbook and includes research on current events, labs with higher levels of thinking or application and a significant amount of independent reading. Students should be self-motivated and take ownership of the increased academic workload. Biology is a required course for graduation in Minnesota.

222301-222302 Human Anatomy & Physiology

Prerequisite: Biology

Grades: 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2

AEO

This course is designed for students who are interested in learning more about the structure and function of the human body and/or considering health-related careers. Using varied lab experiences, students will learn how the body's structure reflects its various functions and how it maintains homeostasis. Assessments will involve student-developed models as well as written and practical tests. Each student will have the opportunity to work with human bones and dissect a preserved cat specimen. Students are expected to participate in all lab activities.

222401-222402 (CITS) Human Anatomy & Physiology

Prerequisite: Biology or Honors Biology/Commitment Agreement required

Agreement required

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2

CITS

This is an advanced biology course for students who wish to learn the essentials of human body structure (anatomy) and its functions (physiology). This course is highly recommended for students interested in careers in the health field (medicine, dentistry, nursing, physical therapy) and/or physical education and athletics. It should also be of interest to anyone who is concerned about his/her own physical well-being. The course entails an in-depth study of how the body's structure reflects its various functions and how it maintains a state of constant change. Each student will have the opportunity to work with human bones and dissect a preserved cat specimen. Students are expected to participate in all laboratory activities.

222601-222602 Introductory Chemistry

Prerequisite: Physical Science 9

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2

This course is designed to develop an understanding of chemistry concepts that every person should know. In this course, students will study chemistry concepts in the context of practical decision making and its relevance to everyday lives. For example, through lab, lecture and modeling activities, students will explore chemistry by visiting topics of water, resources, petroleum and everyday applications of the gas laws. This college prep class is designed for students who will attend either college or vocational training after high school and are not likely to take college chemistry. Fulfills Chemistry/Physics graduation requirements.

222701-222702 Chemistry **Prerequisite:** One year of high school science and one year of Algebra or equivalent
Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2 **AEO**

Chemistry is the study of materials, their composition and structure, and the changes that they undergo. Chemistry is a systematic body of knowledge gained from observation, study, and experimentation as opposed to guesswork and opinions. By studying chemistry, students will be able to understand the nature of the materials around them. Students enrolling in Chemistry will gain an understanding of the basic topics of chemistry including atomic structure, element families and the periodic chart, chemical bonding, formula writing, equation writing and balancing, acids and bases, and many others. Substantial emphasis will be placed on laboratory investigations requiring critical thinking, observing, and drawing conclusions. Skill in scientific writing will be developed as well. If your career plans include a college education, Chemistry or Honors Chemistry is recommended. Fulfills Chemistry/Physics graduation requirement.

222801-222802 (CITS) Chemistry **Prerequisite:** One year of high school science and one year of Algebra or equivalent
Commitment Agreement required

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2 **CITS**

Our society depends on science and technology. First-class medical care, sufficient and varied food supplies, comfortable housing, rapid and reliable communication are but a few of the benefits that are a direct result of scientific and technological developments. Chemistry has played an important role in these developments. Honors Chemistry will provide you with a challenging and rewarding laboratory-based experience. Topics of study will include all those typical of a first-year course: atomic and molecular structure, bonding and formulas, chemical equations and their relationship to mass and volume, periodic relationships, acids, and bases. Emphasis will be placed on investigative lab work with outcomes both at the knowledge and skill levels. Considerable time will be spent developing and improving the student's abilities to observe, think critically, and communicate results and observations through scientific writing. Fulfills Chemistry/Physics graduation requirement.

222941-222942 Aerospace Physics

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2 **CTE**

Aerospace Physics is a hands-on, applied course where students learn the concepts of Physics through the exploration of Aerospace Engineering and Design. This course has been designed for students who want to learn Physics as well as explore the science of flight. During the year, students will gain a strong understanding of physics principles while being introduced to the theories of flight, the principles of engineering, and airplane design and manufacturing. The course uses problem based learning to enhance learning in theory of flight, airplane design, and airplane construction. Aerospace Physics has been designed for students who like hands-on problem solving, collaborative teamwork and creatively finding solutions. For the course final project, students will collaboratively use physics and engineering principles to design a model aircraft, build it and fly it. This course is an exciting opportunity for students interested in pursuing careers in engineering, airplane mechanic or technician, pilot, or any field within the aviation industry. Part of the course has been modeled in conjunction with Lake Superior College *Aviation Physics and Math* course. Fulfills Physics for science graduation requirement.

222951-222952 Introductory Physics

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2

The conceptual approach engages students with analogies and imagery for real-world situations to build a strong understanding of physical principles ranging from classical mechanics to current physics theories. With this strong foundation, students will be better equipped to understand the equations and formulas of physics, and to make connections between the concepts of physics and their everyday world. This course is for students who want to learn about physics, but may have difficulties with higher level mathematics. Fulfills Chemistry/Physics graduation requirement.

223001-223002 Physics

Prerequisite: Geometry

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2 **AEO**

Physics is a physical science that describes and explains the nature and interactions of matter and energy. Concepts, relationships, ideas and practical application are stressed rather than rote memorization. This course is recommended for future college and technical school students and students with a strong interest in science. Topics of study will include velocity, momentum, energy, acceleration, light, electricity, force, waves, magnetism, and Newton's laws of motion and gravitation. Fulfills Chemistry/Physics graduation requirement.

223101-223102 (CITS) Physics

Prerequisite: Completion or currently enrolled in Algebra 2

Commitment Agreement Required

Grade(s): 11-12 **Credit:** .5 per semester **Term(s):** 1 & 2 **CITS**

CITS Physics is for the college bound student seeking science, mathematics, engineering, or technology majors. Work assignments will be both more comprehensive and in depth than the regular physics course. Topics of study will include velocity, momentum, energy, acceleration, light, electricity, force, waves, magnetism, and Newton's laws of motion and gravitation. Fulfills Chemistry/Physics graduation requirement.