SCIENCE

FOUNDATIONS OF BIOLOGY 1: CELLS AND VARIATION 136140
Grades 9-10
FND BIO 1
1/2 Science Credit
Prerequisite: Department approval.

This introductory semester course is designed for the students who have had difficulty with prior courses in science. This course has the theme: What is the basis of life and how does it vary? Students will conduct controlled experiments using the experimental design process. They will study biochemistry, prokaryotic and eukaryotic cells, cell environment, aspects of cell division, Mendelian genetics, meiosis, and the unity and diversity of life. The topics will be presented through numerous laboratory activities, lectures, and discussions; and will emphasize process and thinking skills.

BIOLOGY 1: CELLS AND VARIATION 137140
Grades: 9-10
BIO 1 CELLS
1/2 Science Credit
Prerequisite: None

This is the initial course in a sequence of biology courses that together will provide a college preparatory experience in the life sciences. This course has the theme: What is the basis of life and how does it vary? Students will conduct controlled experiments using the experimental design process. They will study biochemistry, prokaryotic and eukaryotic cells and cell environment, aspects of cell division, Mendelian genetics, meiosis, and the unity and diversity of life. The topics will be presented through numerous laboratory activities, lectures, and discussions; and will emphasize process and thinking skills. Students may take this course concurrently with Matter and Change and/or Forces and Motion in One Dimension.

BIOLOGY 2: EVOLUTION AND ECOLOGY
Grade: 9-10 **137150**
BIO 2 EVOL
1/2 Science Credit
Prerequisite: Biology 1: Cells and Variation

This second course in the biology sequence has a theme of "How is Life Interrelated?" Students will explore the unity and diversity of life through the study of evolution by natural selection. The structure and replication of DNA along with protein synthesis will be examined. The interdependence of all living things will be explored with emphasis on ecological processes and human impact on the biosphere. The processes of photosynthesis and respiration will be introduced. These topics will be presented through numerous laboratory activities, lectures and discussions and will emphasize process and thinking skills. The Missouri Biology End of Course assessment is given at the conclusion of this course.

HONORS BIOLOGY 2: EVOLUTION AND ECOLOGY 138150
Grades 9-10
+BIO 2 EVOL
1/2 Science Credit
Prerequisite: Honors Biology 1: Cells & Variation or departmental approval

This second course in the biology sequence has a theme of How is Life Interrelated? Students will explore the unity and diversity of life through the study of evolution by natural selection. The structure and replication of DNA along with protein synthesis will be examined. The interdependence of all living things will be explored with emphasis on ecological processes and human impact on the biosphere. The processes of photosynthesis and respiration will be introduced. These topics will be presented through numerous laboratory activities, lectures and discussions and will emphasize process and thinking skills. This course is designed to challenge the top ten percent of students. It is more intensive and requires increased levels of critical thinking and mathematical reasoning. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. A weighted grade is given. The Missouri Biology End of Course Assessment is given at the conclusion of this course.

HONORS FORCES AND MOTION IN ONE-DIMENSION 138310
Grades: 9-10
+PHYSICS:FOR
1/2 Science Credit
Prerequisite: 8th grade recommendation, Algebra 1, and departmental approval

Laboratory safety, experimental design, problem-solving skills, and graphical analysis will be utilized in the study of forces and motion in one dimension. It is more intensive and requires more critical thinking than Forces & Motion in One-Dimension. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. A weighted grade is given.

SCIENCE

FOUNDATIONS OF BIOLOGY 2: EVOLUTION AND ECOLOGY **136150**
Grades: 10-11
FND BIO 2
1/2 Science Credit
Prerequisite: Foundations Biology 1: Cells and Variation

This semester course is designed for students who have had difficulty with prior courses in science. This course has a theme of "How is Life Interrelated?" Students will explore the unity and diversity of life through the study of evolution by natural selection. The structure of DNA and protein synthesis will be introduced. The interdependence of all living things will be explored with emphasis on ecological processes and human impact on the biosphere. The processes of photosynthesis and respiration will be introduced. These topics will be presented through numerous laboratory activities, lectures and discussions and will emphasize process and thinking skills. The Missouri Biology End of Course assessment is given at the conclusion of this course.

FOUNDATIONS OF MATTER AND CHANGE
Grades: 10 **136210**
FND CHEM:MAT
1/2 Science Credit
Prerequisite: Department approval

Laboratory safety, experimental design, problem solving skills, and graphical analysis will be utilized in the study of a variety of relationships in the chemical world. The study of matter and how matter can change is the primary focus of this course, with additional topics possibly including phase changes and gases, the history of the atom, and how atoms bond.

FOUNDATIONS OF FORCES AND MOTION IN ONE-DIMENSION
136310
Grades: 10-11
FND PHY:FORC
1/2 Science Credit
Prerequisite: Department approval

This class will cover topics including laboratory safety, measurement, scientific inquiry, graphical analysis, and forces and motion in one dimension. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences, requiring student collaboration and multiple-step problem solving execution, will be frequent.

FORCES AND MOTION IN ONE-DIMENSION
Grades: 10-11 **137310**
PHYSICS:FORC
1/2 Science Credit
Prerequisite: One semester Algebra 1 with C or better recommended or departmental approval

This semester course is the first in a recommended series of physics courses. This class will cover topics including laboratory safety, measurement, scientific inquiry, graphical analysis and the study of forces and motion in one dimension. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences requiring student collaboration and multiple-step problem solving execution will be frequent.

BIOLOGY 3: BIOTECHNOLOGY AND SYSTEMS
Grades 10-12 **137160**
BIO 3 TECH
1/2 Science Credit
Prerequisite: Biology 1: Cells and Variation, Biology 2: Evolution & Ecology, Matter & Change or departmental approval

This course completes the initial college preparatory sequence and has the themes: "How does biotechnology impact life?" and "How is life organized for success?" The students will investigate a variety of concepts such as DNA fingerprinting and genetic engineering. Students will explore and compare plants, and animals (including humans) at the system and molecular levels. Other topics will include photosynthesis and cellular respiration. These topics will be presented through numerous laboratory activities and will emphasize process and thinking skills.

HONORS BIOLOGY 3: BIOTECHNOLOGY AND SYSTEMS **138160**
Grades: 10-12
+BIO 3 TECH
1/2 Science Credit
Prerequisite: Honors Biology 1: Cells & Variation or departmental approval, Honors Biology 2: Evolution and Ecology, Honors Matter & Change or departmental approval

This course completes the initial college preparatory sequence and has the themes: How does biotechnology impact life? and How is life organized for success? The students will investigate a variety of concepts such as DNA fingerprinting and genetic engineering. Students will explore and compare microbes, plants, and animals (including humans) at the system and molecular levels. Other topics will include metabolism and disease. These topics will be presented through numerous laboratory activities and will emphasize process and thinking skills. This course is designed to challenge the top ten percent of students. It is more intensive

and requires increased levels of critical thinking and mathematical reasoning. It is designed for the student who anticipates a science-based career, desires an accelerated science program, and intends to take advanced courses in science. A weighted grade is given.

CHEMISTRY **137201/137202**
Grades: 10-12
CHEMISTRY
1 Science Credit
Prerequisite: Matter & Change and Algebra 1 with a recommended C or above or department approval

This course can fulfill the third required year of science credit and completes the recommended core curriculum in chemistry. Topics include atomic structure and history, The Periodic Table and periodicity, bonding and nomenclature, the mole and stoichiometry, states of matter, kinetics, thermochemistry, and acids and bases. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences, requiring student collaboration and multiple-step problem solving execution, will be frequent.

HONORS CHEMISTRY **138201/138202**
Grades: 10-12
+CHEM
1 Science Credit
Prerequisite: Honors Matter & Change or department approval

This course can fulfill the third required year of science credit and completes the recommended core curriculum in chemistry. Topics include atomic structure, periodicity, bonding, nomenclature, chemical reactions, stoichiometry, gas laws and physical states, thermochemistry, solutions, kinetics and equilibrium, acids and bases, nuclear science and energy, and an introduction to organic chemistry. Group interaction, discussion, and cooperation during laboratory practice and mathematical problem-solving sessions will be commonplace. Open-ended lab experiences, requiring student collaboration and multiple-step problem solving execution, will be frequent. It is more intensive and requires more critical thinking than Chemistry. It is designed for the student who has an exceptional interest in science and desires an accelerated science program. Class lectures will often feature advanced, cognitive material delivered at a great pace and depth. A weighted grade is given.

SEMESTER ELECTIVES IN SCIENCE

CONCEPTS OF CHEMISTRY **136201/136202**
Grades: 10-12
CON CHEM
1 Science Credit
Prerequisite: Matter & Change and Algebra 1

This course is designed for those students who wish to obtain an understanding of the science of chemistry and its application in everyday life. The major concepts of chemistry are introduced with a minor emphasis on mathematical applications. The course will include topics such as atomic structure, periodic trends, physical and chemical properties, chemical formulas, chemical equations, chemical bonding, properties of gases, acid/base chemistry, solutions and nuclear chemistry. Additional topics may include organic chemistry, energy resources, mineral resources and chemistry in medicine. Wherever possible, the study of these topics will be complemented by activities and laboratory investigations.