## SCIENCE REQUIREMENT

### Courses

**BIO**

**BIO 100. Basic Biological Science. 3 Credits.**

LEC (2), LAB (2)


Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

**BIO 110. General Biology. 3 Credits.**

LEC (2), LAB (3)

The concepts general to all living organisms such as cell structure and function, genetics, evolution, and ecology. This course is designed for majors in biology and related scientific areas.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

**CHE**

**CHE 100. Concepts of Chemistry. 3 Credits.**

LEC (2), LAB (1)

A broad survey course with a laboratory experience that seeks to develop an understanding of the field of chemistry through inquiry. Basic competence in scientific methods and procedures will be obtained by observing chemical reactions and studying the chemical and physical properties of a variety of compounds.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall.

**CHE 103. General Chemistry I. 3 Credits.**

Basic laws and theories of chemistry, including atomic structure, chemical bonding, oxidation-reduction, solutions, and ionic equilibria. Correlations of chemical principles and their application to modern descriptive chemistry. CHE 103 must precede CHE 104.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**CHE 107. General Chemistry for Allied Health Sciences. 4 Credits.**

A one-semester treatment of the fundamentals of chemistry, including atomic structure and bonding, types of reactions, kinetics, equilibrium, and thermodynamics. May not be taken as a chemistry major elective. CRL 107 may be taken concurrently or after CHE 107.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**CHE 160. The Chemistry of Beer. 3 Credits.**

An introduction to the chemistry of beer, including its properties, ingredients, production, and origins. The chemistry and biochemistry of alcohol will also be covered.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**CSC**

**CSC 110. Fundamentals in Computer Science. 3 Credits.**

Introduction to the fundamentals of computing. Topics include surveys of the following sub-areas of computer science: artificial intelligence, hardware/operating systems, programming languages/software, ethics/social issues, history, electronic communications, problem solving, and programming. The course includes laboratory projects in application software, programming, and electronic communication, as well as a report on one of the first four areas above.

Gen Ed Attribute: Science Distributive Requirement.
Distance education offering may be available.
Typically offered in Fall, Spring & Summer.

**CSC 115. Introduction to Computer Programming. 3 Credits.**

The art and science of computing are introduced using a structured programming language, such as Visual BASIC. Topics include looping, branching, arrays, and program development.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

**CSC 141. Computer Science I. 3 Credits.**

An introduction to programming using Java. Topics covered include basic program layout, primitive data types and strings, control structures (loops and decisions) methods, parameters, and text file input/output.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

**ESS**

**ESS 101. Introduction to Geology. 3 Credits.**

LEC (2), LAB (2)

The earth’s composition and history; the processes that occur on and within the earth. Two hours of lecture and two hours of lab.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

**ESS 111. Other Worlds, Other Stars. 3 Credits.**

An introductory course in astronomy. Topics will focus on the observable changes in the night sky, the properties of light, the laws of motion, the formation and composition of the solar system, extra solar planets, the properties of stars, stellar evolution and stellar death.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**ESS 112. Galaxies and Cosmology. 3 Credits.**

An introductory general education course in astronomy. Topics will focus on the properties of light and matter, the evolution of stars and galaxies, and the expansion, structure, history and fate of the universe. Three hours of lecture.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**ESS 130. Our Coastal Ocean. 3 Credits.**

LEC (2), LAB (2)

This course examines the physical and biological processes at work in the coastal oceans. The content will be discussed in the framework of regional examples.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**ESS 170. Introduction to Our Atmosphere. 3 Credits.**

Why is the sky blue? What will the weather be tomorrow? What makes tornadoes? How did the ozone hole develop? What is the greenhouse effect? This class will use these questions and others to investigate the basic physical processes that determine the weather and climate on earth. A student who has successfully completed ESS 370 may not subsequently receive credit for ESS 170.

Gen Ed Attribute: Science Distributive Requirement.
Distance education offering may be available.
Typically offered in Fall & Spring.

**GEO**

**GEO 104. Introduction to Geospatial Technology and Analytics. 3 Credits.**

This course develops critical thinking skills through the exploration of the fundamental components of data analytics in terms of spatial data and geospatial technologies. This includes the basic concepts and skills related to the 3 core areas of analytics, 1) data, 2) analysis, and 3) visualization. Data structures and skills are examined within the context of Geographic Information Systems (GIS). Spreadsheets, database tools, GIS software, and geospatial technology are used to capture, manage, and store spatial data. Analysis tools, such as spreadsheet functions, scripts, and GIS software are used to investigate data sets related to discipline-specific projects. Geovisualization of results are communicated using map applications, dash boards, and story maps.

Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

**PHI**

**PHI 125. Theology & Science: Enemies or Partners?. 3 Credits.**

An inquiry into the relationship of theology to the natural sciences. Team taught by both a physicist and a philosopher, the course investigates how ideas of God have been affected by advances in physics and biology.

Typically offered in Spring.

Cross listed courses PHI 125, PHY 125.
PHY

PHY 100. Elements of Physical Science. 3 Credits.
A study of motion, energy, light, and some aspects of modern physics.
Gen Ed Attribute: Science Distributive Requirement.
Distance education offering may be available.
Typically offered in Fall & Spring.

PHY 105. Structure of the Universe. 3 Credits.
A survey of phenomena and objects in the universe from the very smallest distance scales to
the grandest in the cosmos. Includes a historical consideration of the developments of modern
theories of the physical world.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

PHY 123. Food, Fire, and Physics: The Science of Cooking. 3 Credits.
An exploration of food and cooking from a physical science perspective. Principles of soft
matter physics (e.g. phase diagram, intermolecular forces, rheology, diffusion, self-assembly,
polymer physics) are discussed and used to gain insight into food and cooking.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Spring.

PHY 125. Theology and Science: Enemies or Partners. 3 Credits.
An inquiry into the relationship of theology to the natural sciences. Team taught by both a
physicist and a philosopher, the course investigates how ideas of God have been affected by
advances in physics and biology.
Typically offered in Spring.
Cross listed courses PHI 125, PHY 125.

PHY 130. General Physics I. 4 Credits.
LEC (3), LAB (2), DIS (1)
An introductory, noncalculus, physics course. Mechanics of solids and fluids, wave motion, heat
and temperature, thermodynamics, and kinetic theory.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

PHY 140. General Physics II. 4 Credits.
LEC (3), LAB (2), DIS (1)
An extension of PHY 130. Electricity and magnetism, geometrical and physical optics, and
modern physics.
Pre / Co requisites: PHY 140 requires prerequisite of PHY 130.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall, Spring & Summer.

PHY 170. Physics I. 4 Credits.
LEC (3), LAB (2), DIS (1)
An introductory laboratory-based course. Includes mechanics, kinetic theory, waves, heat, and
thermodynamics. The laboratory emphasizes error analysis, the writing of technical reports,
and data analysis using computers.
Pre / Co requisites: PHY 170 requires a prerequisite of MAT 161.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.

PHY 180. Physics II. 4 Credits.
LEC (3), LAB (2), DIS (1)
A continuation of PHY 170. Includes electricity and magnetism, geometrical and physical
optics, electronics, and modern physics.
Pre / Co requisites: PHY 180 requires prerequisite of PHY 170 and co-requisite of MAT 162.
Gen Ed Attribute: Science Distributive Requirement.
Typically offered in Fall & Spring.