

SCIENCE

GRADUATION REQUIREMENT: 3 years (including Biology and Chemistry)			
Freshmen	Sophomores	Juniors	Seniors
Selections dependent on teacher recommendation			
Physical Science or Honors Biology	Biology or Honors Biology or Chemistry or Honors Chemistry	Chemistry or Honors Chemistry or Honors Physics 11 or Environmental Studies or Honors Environmental Studies or AP Biology	Physics/Honors Physics or Environmental Studies or Honors Environmental Studies or AP Biology

The science program at Saint Thomas Academy prepares students for college science courses. We offer sequences for students who are interested in science or engineering programs in college and for those who may not intend to take advanced science courses in college. Students study fundamental scientific principles, theories, and mathematical relationships, and learn scientific reasoning through inquiry-based laboratory investigations. In addition, it is our intent that students will:

- Understand the role of science and technology in their lives.
- Use scientific methods to analyze and solve problems.
- Make valid and ethical decisions about scientific issues.
- Become sensitive to the global implications of life-style choices.
- Evaluate their potential for careers in science.

PHYSICAL SCIENCE

Grade Level: 9

1 year

Weight: 1.0

This course introduces the basic concepts of force, motion, energy, and the properties and particle nature of matter. Laboratory activities teach skills such as measuring, recording data, interpreting information, and using evidence to make conclusions.

BIOLOGY

Grade Level: 10

1 year

Weight: 1.0

This course introduces students to the fundamental concepts of biology including cellular biology, genetics, microbiology, animal and plant biology, evolution, and ecology. Introductory laboratory skills are developed with emphasis on collection, observation, and interpretation of data.

HONORS BIOLOGY 1 year
Grade Level: 9-10 Weight: 1.1
Prerequisite: Instructor approval;
9th grade: Selection based on entrance exam
and/or performance on STA Physical Science
examination and Middle School science grade of
B+ or better.
10th grade: Grade of B or better

This course focuses on cellular biology, genetics, microbiology, zoology, plant biology, evolution and ecology. College level pedagogy is stressed, as is development of analytical skills in a concentrated laboratory program.

CHEMISTRY 1 year
Grade Level: 11 Weight: 1.0
Prerequisite: Algebra and Geometry; Biology or
Honors Biology

This course focuses on scientific measurement, chemical nomenclature, atomic theory, molar relationships, chemical reactions, stoichiometry, gases, solutions, acids and bases, and properties of elements and compounds. Mathematical problem solving and a quantitative/qualitative laboratory program are stressed.

HONORS CHEMISTRY 1 year
Grade Level: 10-11 Weight: 1.1
Prerequisite: Instructor approval; Biology or
Honors Biology, Algebra II/Trigonometry (C or
better) or concurrent registration in Honors
Algebra II/Trigonometry

This course introduces students to scientific measurements, chemical nomenclature, atomic theory, molar relationships, stoichiometry, thermodynamics, theories of solutions, acids, bases, equilibria, properties of elements and compounds and their structural deviations, a study of laws governing the behavior of matter, and organic chemistry. A mathematical approach to problem solving and a quantitative/qualitative approach toward laboratory investigation are stressed.

HONORS PHYSICS 11 1 year
Grade Level: 11 Weight: 1.1
Prerequisite: Instructor approval; Honors
Biology, Honors Chemistry, Algebra
II/Trigonometry (all with B+ or better)

This course deals with matter and energy relationships through hands-on laboratory investigations. Topics include mechanics, thermodynamics, wave theory, optics, electricity, and modern physics. Enrollment in Honors Physics 11 is concurrent with enrollment in Advanced Placement Biology for the student's senior year science.

PHYSICS/HONORS PHYSICS 1 year
Grade Level: 12 Weight: 1.0/1.1
Prerequisite: Instructor approval; Chemistry or
Honors Chemistry, Algebra II/Trigonometry (all
with C or better)

This course deals with matter and energy relationships through hands-on laboratory investigations. Topics include mechanics, thermodynamics, wave theory, optics, electricity, and modern physics. Students are invited by the instructor, (based on first quarter performance), to do honors level work with emphasis added on laboratory work and out-of-class investigations.

ENVIRONMENTAL STUDIES 1 year
Grade Level: 11-12 Weight: 1.0
Prerequisite: Instructor approval; Biology and
Honors Chemistry or Chemistry (C or better)

This course covers four areas of environmental concern: water ecology, global ecology, naturalist methods, and water research. Water quality analysis and report generation are a focal point of this course. Community service is an integral component of the course. Students will perform water quality assessments, land use surveys, assist in the eradication of buckthorn, and many other community based activities. This class has over twenty monitoring sites from which to assess and generate water quality reports that are shared with local agencies and landowner associations. This class is based on an internship model and students must be willing to work outdoors throughout the entire year.

HONORS ENVIRONMENTAL STUDIES

1 year
 Grade Level: 11-12 Weight: 1.1
Prerequisite: Instructor approval; Biology or Honors Biology and Chemistry or Honors Chemistry (grade of B+ or better in both)

Intended for: highly motivated students interested in a rigorous course which balances applied learning, community service, and incorporation of a college level text.

This course covers five areas of environmental concern: ecological principles, human population and resources, environmental quality and pollution, environment and society, and sustainability. In addition to text reading and assessments, students will perform water quality testing, present results to the Mendota Heights City Council, and perform community service. A one-week marine biology dive trip to Grand Cayman Island (at the student's expense) will be offered to students who demonstrate high levels of motivation, responsibility, interest, and academic achievement. The trip will occur during early summer.

ADVANCED PLACEMENT BIOLOGY 1 year
 Grade Level: 11-12 Weight: 1.2
Prerequisite: Instructor approval; Chemistry or Honors Chemistry and Honors Biology (B or better)

This course is under the supervision of the biology department of St. Mary's University from which four college credits may be earned. It is comparable to an introductory, upper-level freshman college biology course. A textbook costing \$90.00 is required for this course. **Weight changes to 1.1 if student does not take the AP exam.**

POSSIBLE SCIENCE SEQUENCES

