

This Student Is Enrolled In a 4-Year, Competitive, Integrated, Accelerated Program

MATH/SCIENCE/TECHNOLOGY CENTER

Mecosta-Osceola Intermediate School District • 15760 190th Avenue, Big Rapids, MI 49307 • 231-796-3543

Program Profile

Governance: Two County Public Consortium

Higher Ed. Partner: Ferris State University, Big Rapids

Grades Served: Ten through Twelve

Total Membership: 43

Admission: Competitive application/interview

Region size in square miles: 1,104

High Schools Served: 6

Program Structure: Four-year, 40% of day

Year Founded: 1993

First Graduating Class: 1997

Member of:

National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology



Program Overview: The MSTC is a competitive program serving 3.3% of the regions' six high school population. The admission process includes scores from the ACT Plan, middle school grades, three adult recommendations and an interview. Twenty-six freshmen enter the program each fall from a pool of 80-90 applicants. The freshman and sophomore curriculum is integrated, accelerated, and emphasizes hands-on cooperative learning through labs, lecture, guest instructors and field trips. Freshmen are required to participate in two community service projects: assisting with the annual Water Festival and annual Regional Science & Engineering Fair. Research projects are required during the sophomore year. Juniors and seniors are enrolled in courses at our partner university, Ferris State University.

High School Transcript:

The Math/Science/Technology Center does not issue a transcript. All MSTC grades may be found on the student's home high school transcript or Ferris State University transcript. Course names are coded differently at each high school but generally correspond to the MSTC Course Descriptions on the reverse side of this Profile. Some students may substitute courses to accommodate their even higher level of understanding. Note the varieties of courses listed: Ninth and tenth grade courses taught by our faculty on the campus of Ferris State University, MSTC cadre classes taught by FSU faculty on the FSU campus; and FSU college courses taught by FSU faculty on the FSU campus.

Student Research:

Research projects begin in the freshman year and culminate with presentations at the Mecosta-Osceola Regional Science & Engineering Fair, the Michigan High School Science & Math Symposium the International Science & Engineering Fair and the NCSSSMST National Student Research Symposium. Students are matched with university, industry or government scientists, engineers, or mathematician mentors.

Student Field Trips:

Major field trips supplement and enrich our curriculum. These trips may include:

- * NCSSSMST National Student Leadership Conference
- * MSTC Hawaii Volcanoes & Marine Biology Field Trip, Hawaiian Islands
- * MSTC Isle Royale National Parke Biology/Ecology Field Trip, Isle Royale Michigan
- * MSTC Alaska Research, Geology & Man's Impact on the "Last Frontier"



Presenting research findings at ISEF.



Accelerated math, science and research followed by internships, college courses and labs as upperclassmen.



Annual student activities promote Team-Building. These range from Cardboard Boat Race to Statewide Spaghetti Bridge Contest.

Math/Science/Technology Center and Ferris State University Course Descriptions (Some students coursework varies based on individual advanced needs. See transcripts.)

- MSTC 9th Grade Mathematics:** Curriculum focus is on Michigan High School Content Expectations in Advanced Algebra, Trigonometry and Geometry. All 9th and 10th grade courses offered in Trimester format.
- MSTC 9th Grade Integrated Science:** Addresses Michigan High School Content Expectations in Chemistry, Physics, with additional components of Biology/Ecology and Earth Science.
- MSTC 10th Grade Mathematics:** Integrates Algebra II, Statistics, Analytical Geometry with components of Trigonometry.
- MSTC 10th Grade Integrated Science:** Combines Advanced Biology, Marine Ecology and Biochemistry.
- MSTC 10th Grade Research:** Year-long individual research project mentored by local, regional and national professionals. Includes problem definition, literature search, writing an abstract, hypothesis construction, data collection, statistical analysis, and conclusions ending with a graphical presentation at the regional, state, national or international level.

High School Courses taught by Ferris State University Faculty on FSU Campus

- MSTC 11th Grade Physics.** One Semester. Lab based physics course expanding and enriching the Michigan High School Content Expectations in Physics.
- MSTC 11th Grade Chemistry.** One Semester. Lab based general chemistry survey course in which students learn the foundational concepts of chemistry including atomic structure, chemical bonding, interpretation of equations, solution chemistry, and an introduction to acids and bases. Concurrent laboratory sessions include experiments illustrating the principles discussed in lecture.
- MSTC 11th Grade Statistics.** One Semester. Practical aspects of sampling, data presentation, measures of central tendency and dispersion, basic probability theory, the normal probability distribution, the sampling distribution of sample means and sample proportions, confidence intervals and hypothesis tests for one-sample designs, simple linear regression and correlation.

Regular Ferris State University Courses taught by FSU Faculty on FSU Campus

- FSU Math 130 Adv. Algebra & Analytical Trig:** Quadratic equations, inequalities, straight lines, graphing equations, functions and inverse functions, exponential and logarithmic functions, trigonometry from an analytical point of view, sequences, mathematical induction, and the binomial theorem. (4 Credits)
- FSU Chemistry 121:** Fundamental principles, laws and theories of general chemistry, including stoichiometry, gas laws, thermochemistry, atomic structure, chemical bonding, periodicity, liquids and solids, solution chemistry, and theories of acids and bases. Concurrent laboratory/workshop sessions will include exercises illustrating the principles discussed in lecture.
- FSU Math 220 Analytical Geometry & Calculus 1:** The first of a three-semester sequence in analytical geometry and calculus. Topics include: the limit, the derivative, differentiation of algebraic and transcendental functions, and definite and indefinite integration. (5 Credits)
- FSU Math 230 Analytical Geometry and Calculus II:** The second of a three semester sequence in analytical geometry and calculus. Topics include applications of integration, integration techniques, infinite series, conic sections, parametric equations and polar coordinates. (5 Credits)
- FSU Math 320 Analytical Geometry and Calculus III:** The third of a three-semester sequence in analytic geometry and calculus. Topics include: vector valued functions, functions of several variables, and multiple integrals. (3 Credits)
- FSU Biology 121 General Biology I:** Topics include an introduction to scientific thinking, ecology, Mendelian genetics, evolution, and the diversity of the biological kingdoms, with concentrated study of cell theory and cell structure, the Monera, Protista, Fungi and Plantae. Laboratory exercises are designed to enhance the lecture material with hands-on experiences. (4 Credits)