



THOMAS MORE UNIVERSITY

Physics

Dual-Credit Pathway

Pathway Description:

The Physics Department at Thomas More University offers a challenging curriculum designed to prepare the student for further work and study in business, industry, and graduate school. The program develops the student's appreciation and problem-solving abilities in such areas as Dynamics, Electromagnetic theory, Thermal Physics, Quantum Mechanics and Modern Physics.

Students learn Physics not only in the small, personalized atmosphere of lecture courses, but also through hands-on experimentation provided by the laboratory and research components of the curriculum. Research projects are chosen by the student in consultation with a faculty mentor. Projects are possible in computer interfacing, electronics, observational astronomy, among other concentrations. Computer programming abilities are developed as part of both lecture and laboratory courses.

Pathway Courses

Physics Majors or if enrolled in high school calculus/AP Calculus:

Semester	Course	Title
Fall	MAT 151	Calculus Analytic Geometry I
Fall	PHY 141/PHY 141L	General Physics I (with Lab)
Spring	MAT 152	Calculus Analytic Geometry II
Spring	PHY 142/PHY 142L	General Physics II (with Lab)

OR if not enrolled in high school calculus/AP Calculus:

Semester	Course	Title
Fall	PHY 121/PHY 121L	Elements of Physics I (with Lab)
Spring	PHY 122/PHY 122L	Elements of Physics II (with Lab)

Pathway Course Descriptions:

- **MAT 151 – Calculus Analytic Geometry I**
 - *Note: This course can fulfill the Math core requirement at Thomas More.*
 - *Note: If you have taken AP Calculus AB, see additional notes below.*
 - Prerequisite: MAT 115 or successful completion of pre-calculus by passing exam or ACT Math 23+.
 - Description: Topics will include, but not be limited to, the following topics: Limits, Continuity, Chain, Product and Quotient rules, 1st and 2nd Derivative Tests, Relative



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Extrema and Curve Sketching, Word Problems and Optimization, Implicit Differentiation, Related Rates, Anti-Differentiation, the Fundamental Theorem of Calculus, Areas and Integration by Substitution. Additional topics may include Differentials, Riemann Sums, and Integration by Parts. Calculators with Computer Algebra Systems (CAS) will not be permitted.

- **MAT 152 – Calculus Analytic Geometry II**
 - *Note: If you have taken AP Calculus BC, see additional notes below.*
 - Prerequisite: MAT 151
 - Description: The techniques of one-dimensional calculus developed in MAT 151 are extended. Course topics include transcendental functions, inverse trigonometric functions, hyperbolic functions, advanced integration techniques including parts, trigonometric substitutions, rational integrands, and quadratic expressions. Also included are indeterminate forms and improper integrals, infinite sequences and series, Taylor's series and polynomials and the binomial series.

- **PHY 121 – Elements of Physics I**
 - *Note: This course can fulfill the Science and Lab core requirement at Thomas More.*
 - *Note: If you have taken AP Physics 1, see additional notes below.*
 - Prerequisite: MAT 115 (C- or better), or MAT 143 or MAT 151 or ACT Math 22+ or SAT Math 550+ or successful completion of pre-calculus by passing exam.
 - Description: An introductory non calculus course in Physics designed for students majoring in disciplines other than math and the physical sciences. The course covers 1- and 2- dimensional motion, vectors, forces, momentum, energy, thermodynamics, and waves.

- **PHY 121L – Elements of Physics I Laboratory**
 - Corequisite: PHY 121
 - Description: An introductory non calculus course in Physics designed for students majoring in disciplines other than math and the physical sciences. Students will perform selected experiments in mechanics, heat, and sound.

- **PHY 122 – Elements of Physics II**
 - *Note: If you have taken AP Physics 2, see additional notes below.*
 - Prerequisite: PHY 121
 - Description: An introductory non calculus course in Physics designed for students majoring in disciplines other than math and the physical sciences. The course covers electric fields, Ohm's Law, magnetism, light, lenses, and some 20th century physics.

- **PHY 122L – Elements of Physics II Laboratory**
 - Corequisite: PHY 122
 - Description: An introductory non calculus course in Physics designed for students majoring in disciplines other than math and the physical sciences. Students will perform selected experiments in sound, electricity, optics, and possibly some 20th century physics.

- **PHY 141 – General Physics I**



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- *Note: This course can fulfill the Science and Lab core requirement at Thomas More.*
- Corequisite: MAT 151
- Description: An introductory calculus-based course for Physics, Chemistry, Math and Pre Engineering majors. Topics include mechanics.
- **PHY 141L – General Physics I Laboratory**
 - Corequisite: PHY 141
 - Description: Students will perform selected experiments in mechanics.
- **PHY 142 – General Physics II**
 - Corequisite: MAT 152
 - Description: An introductory calculus-based course for Physics, Chemistry, Math and Pre-Engineering majors. Topics include electricity and magnetism.
- **PHY 142L – General Physics II Laboratory**
 - Corequisite: PHY 142
 - Description: Students will perform selected experiments in electricity and magnetism.

Certifications Earned:

- n/a

Additional Notes:

- Students taking AP Calculus AB earn credit for MAT 151 at TMU with a score of 3+.
- Students taking AP Calculus BC earn credit for MAT 151 and MAT 152 at TMU with a score of 3+.
- Students taking AP Physics 1 earn credit for PHY 121 at TMU with a score of 3+.
- Students taking AP Physics 2 earn credit for PHY 122 at TMU with a score of 3+.

Links:

- Program website: <https://www.thomasmore.edu/program/physics/>