Opportunities in Physics

• Cadets who study advanced physics can serve the Army as:
  - Maneuver Commanders
  - Battle Staff Officers
  - Astronauts
  - Acquisition Project Managers
  - Army Scientists
  - Nuclear Weapons Experts
  - Space Operations Specialists
  - Intelligence Specialists
  - Engineers
  - Doctors

• Career Field Designations (CFDs) that require advanced physics specialists:
  - FA40: Space Operations
  - FA47: Academy Professor
  - FA49: Operations Research & Systems Analysis
  - FA51: Acquisition
  - FA52: Nuclear & Countering WMD

• Masters and PhD Graduate Level Education Opportunities in Physics:
  - Advanced Civil Schooling (ACS)
    - Top Tier Universities
      (MIT, Stanford, and Harvard)
  - Naval Postgraduate School (NPS)
  - Air Force Institute of Technology (AFIT)

Physics Major Student Learning Outcomes

1. Cadets can apply the laws of physics to formulate mathematical models of physical systems, solve the resulting equations, and apply the solutions to hypothetical and real-world problems.

2. Cadets can apply the laws of physics to formulate and test hypotheses in an experimental setting.

3. Cadets can complete academic assignments and perform research using accepted ethical and scientific standards.

4. Cadets can communicate logical solutions to scientific and technical problems to superiors, peers, and subordinates.

5. Cadets are prepared for graduate education in physics, engineering or related fields.
Why Study Physics?

Throughout history, physicists have observed and recorded the phenomena of natural world, sought explanations of these phenomena, and developed mathematical models to predict the outcomes of experiments. Over the centuries, some hypotheses have become well respected laws, while others have served as stepping stones to better models. In the last hundred year, physicist have pioneered the development of such things as the electrical power grid, radio and microwave communications, nuclear power, and modern computer technology.

The U.S. Military relies on physicists to maintain its lead in cutting edge armaments. Officers with a physics background are able to understand the obstacles and possibilities of present and future technologies. Senior military leaders who control the appropriation of funds need advanced scientific training to make wise purchases. Senior leaders are also responsible for the development of new technologies.

Junior officers with physics training understand the limitations of certain technologies, and can troubleshoot and repair equipment in the field. Their physics education empowers them with skills to solve complex problems, logically and accurately, in a variety of situations.

This is why you should study Physics!

USMA Physics Programs

1) Physics Major (PHY1): Complete 12 required courses with any three-course engineering sequence (3CES).

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<th>2nd Class Yr</th>
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- PH365 Modern Physics
- PH482 Adv. Classical Mechanics
- PH456 Science and Policy
- PH481 Therm. & Stat. Physics
- PH381 Int. Classical Mechanics
- PH384 Applied Optics
- PH485 Laser Physics
- PH486 Experimental Physics
- PH382 Int. Electrodynamics
- XE383 Electromagnetic Fields & Waves
- PH484 Int. Quantum Mechanics
- PH487 Adv. Quantum Mechanics

2) Take MA364 (Engineering Math) 3rd Class yr.

3) Honors in Physics (PHY1H): Honors will be awarded to cadets who meet minimum GPA requirements and take PH389 and one additional courses from the following:

- NE374 Radiological Safety
- SP472 Space and Astrophysics
- PHx89 Advanced Individual Study
- PH495 Special Topics in Physics
- MA371 Linear Algebra
- MA376 Applied Statistics
- MA385 Chaos and Fractals
- MA386 Introduction to Numerical Analysis
- MA396 Numerical Methods for Solutions of Differential Equations
- MA476 Mathematical Statistics
- MA484 Partial Differential Equations
- MA485 Applied Complex Variables

For further information

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