THE GOVERNOR'S SCHOOL
for SCIENCE AND TECHNOLOGY

Computational Physics

Syllabus

2025-2026

COURSE DESCRIPTION

Teaches fundamental principles of physics and scientific programming in Python.

PHY 201 - General College Physics I [4 credits, VPCC dual enrolled] Fall 2025
PHY 202 - General College Physics II [4 credits, VPCC dual enrolled] Spring 2026

Prerequisite(s): MTH 161 or equivalent with a grade of C or better for PHY 201;
MTH 162 or equivalent and PHY 201, both with a grade of C or better for PHY 202

Part I covers classical mechanics and thermodynamics. Includes kinematics, Newton's laws of motion, work, energy, momentum, rotational kinematics, dynamic and static equilibrium, elasticity, gravitation, fluids, simple harmonic motion, calorimetry, ideal gas law, and the laws of thermodynamics. Part II Covers waves, electromagnetism, optics, and modern physics. Includes mechanical waves, sound, electrostatics, Ohm's law and DC circuits, magnetic forces and magnetic fields, electromagnetic induction, ray optics, wave optics, and selected topics of modern physics.

Scientific programming in Python introduces problem solving and implementation of solutions using a programming language in a structured programming environment. Includes concepts and practice of structured programming, problem-solving, and an introduction into object-oriented programming.

Instructor Information

- Instructor   : Dr. Kuchina
- Classroom   : A41
- Office   : A38
- Email   : elena.kuchina@nhrec.org
- Phone   : 757-766-1100 x 3393
- Office Hours   : On Wednesdays and by appointment
- Online Help   : Email, Zoom, Canvas discussion forums.

Textbook and Supplementary Materials

- College Physics: A Strategic Approach; 3rd Edition; Knight, Jones, Field
- College Physics, Schaum's outlines

Communication Policies

Students are responsible for checking their Canvas inbox and their GSST e-mail account regularly, daily at a minimum. Email from students will be returned by the instructor within 24 hours during weekdays and within 48 hours on weekends.

Method of Instruction

The course content will be taught through a series of lectures, hands-on demonstrations, physics and coding assignments, quizzes, tests, projects, and laboratories.

Student Learning Outcomes

- To develop a good functional understanding of physics.
- To develop problem solving skills.
- To develop technology skills.
- To improve communication, interpersonal, and questioning skills.

Homework Assignments & Due Dates

In this course, you can expect a variety of assignments, including physics problems, programming tasks, and lab reports. Physics assignments will be distributed through the online platform *MasteringPhysics*, and all assignment and lab report due dates will be posted on Canvas. It's important to meet these deadlines as late submissions may result in no credit. Make-up assessments, at the instructor's discretion, are available for students with valid and reasonable excuses, with each case assessed individually.

Assessments

Assessments in this course will encompass a variety of methods, including formal evaluations like quizzes and tests, informal assessments such as (clicker) questions at the beginning and/or throughout the class, as well as discussions.

Laboratory

Laboratory sessions will be used to reinforce concepts covered in the lecture as well as to give the student experience in data collection, analysis, and report presentation.

Grading

Quizzes, tests, homework, and laboratory grades are weighted as follows to determine quarterly grades:

- Assignments   35%
- Tests   30%
- Laboratory   25%
- Quizzes & Notes   10%

Course grades will be determined based on the following grading scale:

- 90 – 100%: A
- 80 – 89% : B
- 70 – 79% : C
- 60 – 69% : D
- 0 – 59% : F

Expectations

Students are expected to

- **Be Ready:** Be seated and ready to learn when the bell rings.
- **Stay Engaged:** Be actively focused on educational goals.
- **Stay on Task:** Be attentive and engaged in the assigned tasks.
- **Show Respect:** Demonstrate respect in various ways, including:
    - Maintain Respectful Language: Use polite and considerate language.
    - Respect Peers: Treat classmates with kindness and consideration.
    - Respect Classroom Materials: Take care of classroom resources and materials.
    - Contribute Positively: Encourage a positive and inclusive classroom atmosphere.

Dual Enrollment of PHY II via Virginia Peninsula Community College:
The decision to dual-enroll in a course requires careful consideration. You have options, as you can see from the DE Module on Faculty Advising Canvas course. You may wish to contact your top choice colleges to ask what the impact of taking a dual-enrollment course might be for your goals, particularly if you do not perform to your expectations in the course. Please be aware that you are generating a permanent college transcript with all the courses for which you are dual-enrolled. You can also use the dual-enrollment student guide from Transfer Virginia to help you determine the potential impact.

If you choose to dual-enroll, you must monitor your course grade. If you find you are not earning grades you want to have on your permanent college transcript, you may consider dropping the dual-enrollment portion prior to the Add/Drop date for the term of the course, or to withdraw from the dual-enrollment portion prior to the Withdrawal date. If you choose to withdraw from dual enrollment for the class, you will still earn high school credit and can plan to be well-prepared for the class in college. Dropping will have no record on your transcript, while withdrawal will leave a note on your college transcript indicating you withdrew, but no grade will be recorded on your college transcript. You can request a decline or withdrawal form from me or from Mrs. Yee.

Important Dual enrollment dates are as follows:

Fall Sessions	9/15/25 – 1/23/26
• Confirm VPCC Class Rosters	9/30/25
• Last Date to Add or Drop Class	10/10/25
• Last Date to Withdraw from Class	12/2/25
Spring Sessions	1/26/26 – 6/12/26
• Confirm VPCC Class Rosters	2/10/26
• Last Date to Add or Drop Class	2/14/26
• Last Date to Withdraw from Class	4/16/26

Note that this course, is dual enrolled in the fall and in the spring.

No matter what you choose to do, I will respect your wishes. I want to work with you to support your learning, but I cannot learn the information for you; you will need to invest the requisite effort in the course in order to succeed. This may require you to learn new learning strategies that you haven't used in the past.

I will do my utmost to support your personal learning in the class and encourage you to pursue your goals.