

## PHYS 2120: Calculus Based Physics II

### Instructor Information

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Instructor name:

Office location:

Office phone:

Office hours:

Email address:

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### I. Course Description

A calculus-based course in the concepts and principles of electricity, magnetism, light and optics. This course is primarily intended for students who plan to major in science, engineering, mathematics, or other technical fields at the four-year college level.

**Credit Hours:** 4 Credits (3 Class Hours, 3 Lab Hours)

**Prerequisite:** PHYS 2110

### II. Required Materials

- **Textbook- Choose from one of the following:**  
University Physics with Modern Physics, 13<sup>th</sup> Edition by Hugh D. Young and Roger A. Freeman, Addison Wesley, ISBN 9780321696861, *or*  
University Physics with Modern Physics, 14<sup>th</sup> Edition by Hugh D. Young and Roger A. Freeman, Addison Wesley, ISBN 9780321973610. (Newer edition, same content)
- Second Semester Physics Lab Manual, Provided by NSCC Staff.
- Calculator: A scientific calculator is required for this course.

Once enrolled, all students should verify that they have the correct textbook and materials information by consulting the D2L/NS Online shell for the course. If you are registered with the Access Center and require an alternate format for the textbook and other course materials, please contact the Access Center at 615-353-3721, 615-353-3741, or [accesscenter@nsc.edu](mailto:accesscenter@nsc.edu).

### III. Course Outcomes and Topics

#### *Course Outcomes*

Upon successful completion of this course, the student should be able to:

- Illustrate the nature of electric charge and electrostatic forces.
- Describe the properties of the electric field from both the force and energy points of view.
- Illustrate the applications of Gauss's Law.

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- Appraise the behavior of simple electric circuits including the properties of capacitors, resistors, inductors, and sources of electromotive force.
- Illustrate the difference between DC circuits and AC circuits.
- Discuss magnetism, the magnetic field, the Lorentz force, electromagnetic induction, electromagnetic waves and Ampere's Law.
- Discuss the nature and propagation of light.
- Employ various aspects of geometric and physical optics.
- Discuss the phenomena of Light Interference and Diffraction.

### *Topics*

- |                              |                                   |
|------------------------------|-----------------------------------|
| • Electric Charge and Fields | • EM Induction                    |
| • Gauss's Law                | • Inductance                      |
| • Electric Potential         | • Alternating Current             |
| • Capacitance                | • Electromagnetic Waves           |
| • Current                    | • Nature and Propagation of Light |
| • Resistance                 | • Geometric Optics                |
| • DC Circuits                | • Optical Instruments             |
| • Magnetic Fields and Forces | • Interference                    |
| • Sources of Magnetic Fields | • Diffraction                     |

### *Laboratory Topics*

- Electrostatics
- Electric Field Mapping
- Capacitance
- Introduction to Electric Circuits I
- Introduction to Electric Circuits II
- Ohm's Law
- Magnetism
- Induced Electromotive Forces
- Refraction of Light
- Lenses and Optical Instruments
- Fraunhofer Diffraction
- Spectroscopy
- Charge to Mass Ratio of the Electron

## **IV. Course Policies**

### **Attendance**

Students are expected to attend all scheduled classes and laboratories. Absences in a course may affect a student's final grade. The student is responsible for all assigned work in the course regardless of excused or unexcused absences. Tardiness may also affect a student's final grade.

In online courses, attendance is signaled by logging on to the D2L/NS Online shell, participating as prompted (e.g., responding to an instructor's email, posting to a discussion

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board) and/or completing and submitting assignments. Campus closures do not affect attendance and assignment completion in online courses.

Each instructor will provide further information regarding his/her attendance policy. Failure to attend class could result in a final course grade of “FA” or “FN” (see explanation below), depending on the individual instructor’s course policy.

- FA= Failure, attendance related (unofficial withdrawal). Last recorded date of attendance required. *According to NSCC policy, if a student fails a course, but has not officially withdrawn from the course, and her/his last date of attendance is before the last date to withdraw, the student will receive a grade of FA (i.e., “Failure for Attendance Reasons”).*
- FN= An FN is awarded to students who never attended class.

Please be advised that instructors may have a more specific class policy.

**Method of Assessment/Evaluation-** The following performance assessments will be used to demonstrate students’ understanding, knowledge, and skills: *(Subject to change at instructor’s discretion)*

Course average

Average of unit tests and final examination	= 40% - 75%
Average of the highest ten lab reports	= 25%
Other (quizzes, homework, etc.)	= 0 - 35%

The course letter grade is determined according to the following point ranges: 0-59 = F, 60-69 = D, 70-79 = C, 80-89 = B, and 90-100 = A.

Please consult your instructor for specific information regarding method of assessment.

### **Safety:**

The instructor will review the regulations regarding safety in lab classes. You must turn in a signed copy of the regulations, and you should keep a copy for your records.

### **V. D2L/NS Online and myNSCC**

It is students’ responsibility to check D2L/NS Online course shells for all enrolled courses and myNSCC, including student email, on a regular basis. These are the official communication channels between the college and students, who are responsible for the information communicated through those channels. D2L/NS Online contains specific course information and myNSCC contains information important for other purposes.

### **VI. Technology Statement**

Nashville State's classes are considered to be web-enhanced. Faculty have an expectation that students will use a computer and the Internet to complete assignments, engage in online discussions, and access various course materials through D2L/NS Online course shells. Computers are available for student use at each campus during campus open hours.

### **VII. ADA Compliance Statement**

Nashville State complies with the Americans with Disabilities Act (ADA). If you require accommodations for any courses in which you are enrolled, contact the Access Center at

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615.353.3741 or 615.353.3721, or e-mail [accesscenter@nsc.edu](mailto:accesscenter@nsc.edu). If you are registered with the Access Center and require an alternate format for the textbook and other course materials, please contact the Access Center.

### **VIII. Classroom Misconduct**

Nashville State Community College has a zero-tolerance policy for disruptive conduct in the classroom. Students whose behavior disrupts the classroom will be subject to disciplinary measures. Please review the [Nashville State Student Code of Conduct policy](#). Please be aware that children are not allowed in class or to be left unattended on campus.

### **IX. Academic Misconduct**

Any form of academic dishonesty, cheating, plagiarizing, or other academic misconduct is prohibited. Students are responsible for understanding and abiding by the [Academic Misconduct Policy](#) in the Nashville State Student Code of Conduct. In addition to other possible disciplinary measures that may be applied through regular college procedures as a result of academic dishonesty, the instructor has the authority to assign an “F” or a “zero” for the exercise, paper, or examination, or to assign an “F” for the course. Students may appeal through the appropriate college grade appeal procedures.

### **X. Academic Early Alert System**

Nashville State Community College uses an Early Alert System to let students know of a faculty member’s concern in one or more of these academic areas: lack of attendance, lack of classroom participation, late or missing assignments, and/or poor performance on assignments/tests. \*Please note that Early Alerts do not affect a student’s academic standing. If you receive an Early Alert email, please see your instructor and your academic advisor as soon as possible.

### **XI. RAVE Emergency Alert System**

Emergency events can happen at any time and Nashville State Community College wants to be able to notify students if and when they occur. For this reason, all students have been enrolled in the free RAVE alert system. If you have not already done so, please log in at <https://www.getrave.com/login/nsc> to confirm and update your contact information and notification preferences. It is critical that your information be correct so that you will receive any emergency notifications. Your RAVE Username is your NSCC email address. If you've never received an email from RAVE with your password, or if you need to reset your password, select “Forgot your password?” and a new password will be emailed to you. Should the RAVE system indicate “user not found”, select Register and create your own RAVE account.

### **XII. Inclement Weather & Campus Closings**

Nashville State will use the RAVE alert system to send a text message to students, staff, and faculty about adjusted hours of operation and/or closings at individual campuses. All students should check the Nashville State web site home page at [www.nsc.edu](http://www.nsc.edu) for announcements on campus closures, which may vary from campus to campus. Campus closures will also be announced on local television stations. Students should use their own best judgment in determining whether to report to campus during inclement weather when classes are not cancelled.

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Even when campuses are closed, students are still responsible for completing all assigned work. When classes are cancelled, faculty will post online assignments and any additional instructions in the D2L/NS Online course shell. Check D2L/NS Online for a message from your instructor regarding your online assignment requirements. Faculty have discretion over adjusting deadlines or due date for assignments, but students are responsible for completing all assigned work by the due date established by the instructor.

### **XIII. Class Cancellation Policy**

If the class is cancelled, the instructor will notify all students by posting in the D2L/NS Online course, e-mailing through D2L/NS Online, and/or by posting a sign on the classroom door. In the event of class cancellation, students must access D2L/NS Online to complete classwork and the assignment that will be posted in the course D2L site.

**NOTE:** This syllabus is meant simply as a guide and overview of the course outcomes, topics, classroom policies, and standard college policies. Some items are subject to change or revision at the instructor's discretion. Each instructor will further clarify their criteria for grading, classroom procedures, attendance, exams and dates, etc.