



## PHYS-2212L

### PRINCIPLES OF PHYSICS II Laboratory

### Electricity, Magnetism and Optics

#### University and Instructor Information

**Institution:** Georgia State University | Perimeter College

Department of Physical Sciences, Clarkston Campus

**Instructor:** Martin Okafor

**Associate Professor of Physics**

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**Textbook:**

- [Online GSU-Clarkston Lab Resource Manuals](#) - Online PHYS-2211Lab:
- <http://sites.gsu.edu/claphast/2211LWriteups/>.

**Prerequisites:** MATH 2432 with a C or better.

**Co-requisites:** PHYS 2212 Lecture Course.

**Other Materials** Scientific calculator, portable computer or other personal digital learning mobile device, etc. Students may use their personal smart phones to review available online course materials.

**Course Description** PHYS 2212L is an introductory laboratory course to accompany PHYS 2212 Principles of Physics II lecture course. This laboratory course will include experiments in electrostatics, electric current and circuits, and electromagnetism, and may also include optics and modern physics. Elementary calculus will be used. Assignments are designed to introduce the student to scientific investigative procedures, instruct the student in specific laboratory and research skills, and reinforce concepts covered in the lecture.

**\*This course syllabus provides a general plan for the course, deviations may be necessary.**

### Tutoring & Advisement

#### /Lab periods\*

Monday

Tuesday

Wednesday

Thursday

Friday

- Other times by appointment

#### Periods

10:00 am - 12:00 pm; 04:00 pm - 05:00 pm

10:00 am - 12:00 pm; 04:00 pm - 05:00 pm

04:00 pm - 05:00 pm

04:00 pm - 05:00 pm

\*By appointment

#### Course Assessments

**Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.**

### Lab Course Guidelines

*This course requires the use of a computer and the Internet. You are responsible for completing any online and in-Lab course assignments.* The course materials are accessible online by logging on to iCollege. *Your iCollege username and student identification number are required for online access.* On the first day of class, log on to iCollege and review the course information on the course homepage.

Students may be required to use one RED scantron sheet (to be provided by instructor) during any proctored test or examination.

**Lab Notebooks:** The lab notebook is a record-keeping tool that demonstrates the level of involvement of a student/scientist in the laboratory and lectures. The lab notebook can be an effective and useful learning tool. Each student must maintain a lab notebook for the entire lab course. Students will record notes from pre-lab and post-lab discussions, all raw data acquired from an experiment, relevant information obtained from textbooks or online sources, and show all calculations in the lab notebook. The quality of the lab notebook is determined from the format and organization of records, evidence of attention to record their involvement in the experiment.

Every student must ensure that the lab instructor or designated proctor signs the notebook entry before the student leaves the lab. All acquired data must be recorded in the lab notebook. Any cancelled lab notebook entry must be noted and legible. Failure to follow these guidelines may result in a reduced notebook score for that lab experiment.

**Lab Prep Notes:** When necessary, modifications to an experiment will be announced and posted on the lab iCollege web page or written on the whiteboard in the lab. It is the responsibility of the student to record these prep notes in the lab notebook.

**Formal Lab Reports:** Lab reports will be graded following the guidelines for Formal Lab Reports. All Lab reports must be submitted as specified by the instructor. Pre-Lab assignments must be submitted within the first fifteen minutes of a lab session unless specified otherwise. Every student must submit, at least, one individual formal lab report.

All lab reports must be based on data collectively acquired by all members of that group of experimenters. Prior to the midpoint of the semester, every lab group must submit one formal lab report

for each experiment performed.

After the midpoint of the semester, only one member of a lab group (who signed up for a specific experiment is required to submit an individual formal lab report for that specific experiment, from that group. Other members of that lab group will collectively submit **ONE group Informal Lab Report**, and will be graded according to the Rubric for informal lab report for that lab experiment.

**Informal Lab Reports:** Individual formal lab reports can only be submitted starting with Lab #6.

All lab reports may be kept by the Lab Instructor. All lab reports submitted one day late will be penalized. Any lab reports submitted two days past the scheduled due date, may not be graded!

**Lab Partners:** Lab partners may be assigned by the Instructor on a rotational or random basis. Lab participants in a group must take turns in performing roles required in conducting the experimental procedure, which involves data acquisition data analysis, and lab reporting. A group lab report must show only the names of the active participants in each lab group. No excuses!

Any student who does not actively participate in the data acquisition or data analysis during the lab session is not permitted to report any group's data for the experiment. No lab group is allowed to share experimental data with another group without prior approval by the instructor. Such action will be considered as cheating, and hence punishable.

**Group Peer Roles:** The level of participation of each group member is determined by his/her team peers for each lab performed, based on the individual's performance level in assigned group roles during the conduct of the lab experiments and during the preparation of the lab report. Failure to meet group expectations could result in exclusion from the lab reporting team.

### Course Components

The *Course Tools for Learning* are well-selected and organized to augment the course material and thereby encourage the student to succeed as an active learner. The *Tools for Learning posted on GSU-PC iCollege* (<http://icollege.gsu.edu>) for this course include:

- (1) [Online Lab resource materials](#), including guidelines and grading rubrics for lab notebooks and lab reports;
- (2) *online assignments, including iCollege Quizzes and other assignments;*
- (3) *online [Lab Experiment Manuals](#).*

### Course Content for the PHYS 2212L (Principles of Physics II Lab) course:

The following is a list of potential lab experiments covered in the PHYS 2212L (Principles of Physics II Lab) course. Individual campuses choose experiments based on the available equipment and other factors. A minimum of ten (10) labs, plus an introductory activity on measurement techniques and data analysis, must be performed and reported before any student can qualify to earn a passing grade for this course.

1. Basic Electrical Measurements
2. Electric Field Mapping.
3. Coulomb's Law and Force between Charged plates
4. Ohm's Law.
5. Electrical Power and Joule's law.
6. DC Circuits and Kirchhoff's laws.
7. RC Circuits.
8. Force between Electric Currents.
9. Geometric Optics and Image Formation.
10. Double-slit Interference.
11. Single-slit Diffraction.

12. Magnetic Fields.
13. LRC Circuits.
14. Magnetic Induction and Transformers.
15. Radioactivity.

\*Eleven or more of these experiments must be performed every semester.

## Course Learning Objectives

### Minimum General Learning Objectives for the Introductory Physics Courses:

The objective of this physics course sequence is for the student to learn and be proficient in the application of the basic laws of physics. The sub-headings are specifically for the introductory physics laboratories. After taking one or both of these lab courses, the student should be able to:

1. Interpret physical situations as stated in a word problem;
2. identify the physical laws appropriate to the physical situation at hand;
  - discuss the theoretical basis of the performed experiments in terms described by the complimentary lecture course
3. use various types of data collection tools safely for the experimental investigation of physical laws;
  - properly maintain and use a laboratory notebook to clearly and accurately record and communicate information related to experiments performed
  - perform basic measurements and use scientific tools to collect data as deemed appropriate for the experiments performed
  - use standard safety practices for all classroom and field investigations
4. use mathematics/physical law as a tool for prediction of behavior of representative physical systems:
  - analyze an experiment for sources of error
  - suggest possible corrections and improvements
5. represent physical systems in multiple representations mathematically, pictorially, graphically, and/or in written descriptions, etc.
  - use tools of technology to present the behavior of physical systems during experiments
  - manipulate tools of technology to monitor and revise experiments
6. translate multiple representations, i.e. written, pictorial, graphical and/or data descriptions, of a physical system into an appropriate mathematical model:
  - graphically analyze data acquired from an experiment
  - deduce valid conclusions from this analysis Use mathematics/physical law as a tool for prediction of behavior of representative physical systems;
7. Write a formal laboratory report appropriate for the level of the introductory physics laboratories.

## Content-based Learning Objectives

### EXPECTED EDUCATIONAL RESULTS.

At the completion of this PHYS 2212L course, the student should be able to do the following:

1. Manipulate electrical measuring instruments such as (a) the multimeter (for measuring current, voltage, and resistance), (b) oscilloscope;
2. Construct the patterns of the electric field in the plane containing two electrodes by plotting equipotential lines around the electrodes
3. Investigate the electric force between two charged conducting plates and apply Coulomb's law to calculate the electric permittivity of the medium between those plates.
4. Build a simple electric circuit and draw electric circuit diagrams; apply Ohm's law to investigate the current-voltage relationship to ohmic and non-ohmic resistors
5. Apply Ohm's law with the voltmeter-ammeter method to verify the mathematical relation for the equivalent resistance of a group of resistors that are connected in a series or parallel configurations
6. Determine the electrical equivalent of heat by comparing the electrical power supplied to a resistor with the heat energy dissipated by the resistor
7. Apply Kirchhoff's rules to analyze a multi-loop circuit with multiple voltage sources to determine the currents and voltages across the circuit resistors
8. Investigate the exponential variation of voltage with time for a series resistor-capacitor circuit; determine the value of an unknown capacitor from the measurements of the RC time-constant of the circuit.
9. Investigate the magnetic force between two parallel current-carrying conductors; determine the magnetic permeability constant of the medium between the conductors
10. Investigate the variation of the magnetic field inside a current-carrying solenoid along the symmetry axis of the solenoid.
11. Locate images formed by mirrors and lenses; measure the focal length of concave and convex mirrors; refractive index of glass by applying Snell's law; determine the critical angle at which total internal reflection occurs in glass
12. Determine the wavelength of monochromatic light passing through a pair of parallel slits based on the relative intensity-position graph of the double-slit interference pattern
13. Determine the wavelength of monochromatic light passing through a single slit based on the minima and maxima of the relative intensity-position graph of the diffraction pattern; compare the interference and diffraction intensity variations of the double-slit and single slit.

(\*\*) Content-based assessments must include material from Electricity, Magnetism, and Optics and Modern Physics.

**LAB SYLLABUS – PHYS-2212L Tentative Laboratory Schedule**

**Course: PHYS-2212-006 (16613) Academic term: Spring Semester 2020**

**Location: GSU PC Clarkston - Meets on Wed. 10:00 a.m. - 12:45 p.m.; Rm CC-1210**

Wed.	PHYS 2212L-006 (CRN# 16613)	10:00 to 12:45 PM
15-Jan-2020	Lab Orientation & Math Review	Lab #0
22-Jan-2020	Electrical Measurements	Lab #1
29-Jan-2020	The Electric Field	Lab #2
05-Feb-2020	Coulomb's Law and the Force Between Charged Plates	Lab #3
12-Feb-2020	Ohm's Law	Lab #4
19-Feb-2020	The Electrical Equivalent of Heat	Lab #5
26-Feb-2020	Midterm Exam	Lab Exam
04-Mar-2020	DC Circuits and Kirchoff's Rules	Lab #6
11-Mar-2020	Basic Capacitor & RC Circuit	Lab #7
18-Mar-2020	SPRING BREAK	No Lab
25-Mar-2020	Force Between Electric Currents	Lab #8
01-Apr-2020	Basic Inductor & LC Circuit	Lab #9
08-Apr-2020	Geometric Optics	Lab #10
15-Apr-2020	Double-Slit Interference and Single-Slit Diffraction	Lab #11
22-Apr-2020	Lab Final Exam and Assessment Tests	

Handouts: <http://sites.gsu.edu/claphast/2212LWriteups/>

Special instructions, substitutions and guidelines for experiments may be given by the laboratory instructors if and when necessary.

**Lab Final Exams: PHYS 2212L-006 Wednesday Apr. 22, 2020; Time: 10:00 a.m. - 12:45 p.m.**

*(\*The Instructor may change Test/Exam dates, if and when necessary).*

**Course Grading:**

Total scores from Pre-Lab assignments, Lab notebook, formal Lab reports and Lab Final Exam shall be applied to determine the final course grade for the Semester. Each Student must perform and report a minimum of TEN labs to earn a pass grade for this course. These ten labs must include, at least, one individual formal laboratory report. The score for the individual report cannot be dropped.

Overall course percent scores and course grades for the PHYS-2212L (laboratory) course will be determined, based on the following criteria:

**Grading Criteria:**

<b>MAXIMUM POINTS</b> that can be earned in this course=	<b>1400 points</b>
<b>TEN Lab Experiment scores:</b> The sum of the (ten) highest scores on the experiments performed and reported = [The total points for every lab experiment, <b>including</b> the points for the lab report, (Pre- or Post-lab) <b>Quizzes</b> , must add up to a maximum of 100 points]	<b>1000 points (MAX.)</b>
<b>Midterm Examination</b> This Midterm examination covers all experiments performed by the midpoint of the semester. This midterm exam will be given on the date as scheduled in the syllabus.	<b>100 points</b>
<b>Laboratory Notebook and Participation</b> A maximum of 5 (five) points may be earned for level of participation in performance of the lab activity and the quality of each lab notebook record for an experiment session that is signed by the lab instructor or the lab proctor. This notebook score will be based on a 5-3-1 scale, for ten laboratory sessions. The maximum score for the lab notebook and participation is 50 points.	<b>50 points</b>
<b>Final Examination</b> This comprehensive final examination covers all experiments performed during the semester. The collegewide course-based assessment may be included as a portion of the final exam. The final exam will be given on the scheduled date.	<b>250 points</b>
<b>TOTAL =</b>	<b>1400 points</b>

**Final Grades:**

Reports of students' course grades will be available online. Final Grades based on the overall computed score for this course will be assigned using the following university-approved standard:

1260 – 1400 points (90% - 100%)	A
1120 – 1259 points (80% - 89%)	B
980 – 1119 points (70% - 79%)	C
840 – 979 points (60% - 69%)	D
Less than 840 points (< 60%)	F

**Semester Course Calendar**

**Tentative General Course Schedule:**

• <b><u>DATES TO REMEMBER!</u></b>	
January 13, 2020	First day of classes
January 20, 2020	Holiday, MLK Day (no classes)
March 3, 2020	Midpoint for the full semester courses. Last day to Withdraw
March 16 – 22, 2020	Spring Break (no classes)
April 27, 2020	Classes End for full semester classes
April 28 – May 5, 2020	Final Exams for full semester courses

Final Lab Exam: PHYS-2212L-006	Wednesday, April 22, 2020; Time: 10:00 a.m. - 12:45 p.m.
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**\*ALL EXAMS ARE PROCTORED ON CAMPUS BY AN INSTRUCTOR. (\*The Instructor may change Test/Exam dates, if and when necessary).**

**Georgia State University - Perimeter College Policies**

**ATTENDANCE AND PARTICIPATION POLICY:**

A student is responsible for all announcements made in the course. Absence from class discussions and activities does not relieve you of this responsibility.

**ASSIGNMENTS** will be posted online. Therefore, check the *iCollege* course website frequently and respond appropriately when necessary. If you experience any technical difficulties with your online access and participation, please contact the instructor immediately.

**NO SHOW:** If you do not attend class on campus within the first 1-2 weeks, you will be reported during the "ROLL/ATTENDANCE Verification" period for non-attendance or as a "No Show". Once you are reported as "NEVER ATTENDED/PARTICIPATED" or "STOPPED ATTENDING/PARTICIPATING", a course grade of "PW", "WF", or "W" may be entered on your record for the course.

**WITHDRAWAL POLICY:**

In the belief that college students are mature adults and are responsible for their learning, the number of absences will not be applied in computing the final grade the student earns.

If a student finds it necessary to stop coming to class, the student should take time to initiate the withdrawal from class. Due to failure to withdraw officially from class, a grade of "F" may be reported for the student at the end of the semester.

Please refer to the university webpage on Withdrawals "<http://registrar.gsu.edu/registration/withdrawals/>" :



**"You must complete the procedure to withdraw from a class using PAWS.**

A withdrawal before the semester midpoint does not guarantee a grade of W. "A student has the right to withdraw from a lecture and not the co-requisite lab. A student also has the right to stay enrolled in lecture but withdraw from the co-requisite lab. A student who wants to withdraw from both lecture and lab must submit withdrawal forms for both courses in *GoSolar/PAWS*. There will be NO automatic withdrawal from co-requisite courses. It is the student's responsibility to withdraw from all relevant courses if a student desires to do so. Please refer to the following Syllabus policy:

Syllabus Policy: 2019-2020 Perimeter College Course Catalog

<https://catalog.gsu.edu/associate20192020/university-academic-regulations/#revision-of-class-schedules-add-drop-withdraw>

**Assignment Submissions and Instructor Feedback on Weekends:**

Assessments may be given during regular lab periods. Quizzes and other miscellaneous assignments may be assigned online. Students must read and complete the assignments within the time allowed for each activity in order to earn any points. Assigned written homework will be collected for grading. Students may submit copies of clearly legible, written lab reports or other assignments online in *iCollege*.

**MISSED LABS:** NO lab make-ups for missed labs will be allowed. Special considerations will be given to an extenuating circumstance as may be determined by the Lab instructor. **Every student must perform and report a minimum of TEN labs to earn a pass grade for this course.** Any student who misses more than one lab session out of the eleven labs may be assigned a grade of "PW", "WF", or "W" according to the relevant university policies.

**LATE LAB REPORT SUBMISSION:**

All submitted lab reports that are not date-stamped in *iCollege* by the specified due dates for the assigned lab experiment will be considered as being "late". The penalty for any late submission will be a reduction of the earned score by twenty percent (20%) of the maximum score for each lab assignment up to one week late after the due date of the assignment. All submissions more than FIVE days late without the instructor's permission may not be graded. Students may only submit scanned lab reports/assignments to the instructor via *iCollege* email with special permission. Penalty terms will be applied to late submissions.

**GETTING FEEDBACK FROM THE INSTRUCTOR**

The instructor monitors this course progression, periodically. Therefore, please expect my response to any postings within 24 to 48-hour intervals during weekdays. For online inquiries submitted on weekends (Friday evenings through Sunday nights), please allow up to 72 hours before expecting any posted response to any posting. However, please feel free to ask any course-related question during any class or lab sessions.

**ON-CAMPUS TEST/EXAM POLICY:**

All on-campus EXAMS and Final Examination will be proctored by an instructor. For a scheduled Exam, you may bring your pens, pencils, rulers, and calculators. All mobile communication devices (e.g. phones, personal digital assistants, laptops, etc.) will not be permitted for use in class exams. Writing paper and formulae will be provided. Please do not bring your children or pets to the campus for on-campus exams.

**Physics Formulae:**

Formulae will be provided during tests or final exam in an effort to ensure uniform and equitable access to certain formulae and data for all students. However, NO formulae will be provided for any other online homework or face-to-face class assignments or other activities!

**Lab Equipment:** For every experiment, you must exercise reasonable care in handling and operating any equipment. An entire lab group will be held responsible for any lab equipment and other materials assigned to the group.

**Test/Exam Make-up Policy:**

It is the responsibility of each student to contact the instructor in case of any emergency that hinders the student's class participation and completion of any assignments within the specified time. No extra time will be given to students who are late for a test/exam. All exams are mandatory. A score of zero will be assigned for any missed test/exam. There will not be any make-up for any labs and lab examinations, except in extenuating circumstances as may be determined by the instructor or unless prior arrangements have been made with the instructor.

**Special Instructions/Safety:**

Science Laboratories typically utilize materials which, if handled improperly, may have a hazardous effect on the health of students. This is particularly true for those students who, because of a preexisting health condition, may be abnormally at risk. Examples of such include (but are not limited to):

contact lenses, allergies, pregnancy, nursing mothers, depression of immune system (disease, chemotherapy, transplant patients, etc...).

In regards to any of the above conditions, or are aware of any other condition which would make one especially susceptible to infection and/or toxicity from substances used in this laboratory, please advise the Lab Instructor so that your safety can be given proper consideration.

Students must not eat or drink in the laboratory!

All students must strictly observe and adhere to all safety rules and regulations established for the science labs.

**Online PARTICIPATION GUIDELINES:** Do not post any online comments that will not be appropriate in the traditional classroom. Every online posting by a student must be just as relevant as if in the face-to-face (f2f) traditional classroom setting. Observe good NETIQUETTE (Internet Etiquette) for all online communication. Be professional, courteous, and careful with your online interaction. Remember every comment is recorded!

The instructor can deny any student online access to the course if that student consistently or blatantly disregards these guidelines for online participation. If denied online access, all subsequent interaction will be either through other web access (such as private email) or in print (e.g. US mail).

**Questions:**

Whenever in doubt concerning any aspect of the lab, please do not hesitate to ask the lab Instructor. The lab process should be a learning exercise!

**\*\*\* Review all Syllabus ADDENDA posted on iCollege**

**GEORGIA STATE UNIVERSITY – PERIMETER COLLEGE (GSU-PC) POLICIES**

**POLICY ON ACADEMIC HONESTY:**

*GSU's Academic Honesty Policy* can be found at the following link:

<http://deanofstudents.gsu.edu/faculty-staff-resources/academic-honesty/>

The pdf version of this *GSU's Academic Honesty Policy* can be found at the following link:

<http://codeofconduct.gsu.edu/files/2013/03/2014-2015-Section-II-Academic-ConductStudent-Code-of-Conduct.pdf>.

This Policy on Academic Honesty (Policy) provides examples and definitions intended to clarify the standards by which academic honesty and academically honorable conduct are to be judged. A non-exhaustive list provided in the Policy illustrates the kinds of infractions that may occur, such as Plagiarism, Cheating on Examinations (including tests and quizzes), Unauthorized Collaboration, Falsification, and

Multiple Submissions. Details that clarify each of these infractions are provided in the Policy. Students are strongly encouraged to review and abide by this Policy on Academic Honesty.

Furthermore, any attempt made by a student to intentionally mislead an instructor in the determination of a grade will also be considered as cheating. Cheating includes any attempt to defraud, deceive, or mislead the instructor in arriving at an honest grade assessment. Cheating of any kind may result in a penalty ranging from a grade of zero for the work in question to a grade of F in the course.

### **CONDUCT DURING COURSE**

The online or face-to-face classroom is meant to be a positive, academically stimulating environment that promotes student learning. Students are expected to conduct themselves with utmost self-respect and dignity. You are expected to be considerate of the rights of the other students so as not to disrupt their ability to learn or my ability to teach. This expectation applies to in-class use of cell phones and laptops, peer-to-peer side talk, participation in class discussions, and more. Students who engage in disruptive actions may be asked to leave the class or be excluded for cause.

### **CONDUCT DURING TESTS/EXAMS**

During testing, NO communication between students is allowed without the expressed permission of the testing proctor or Instructor. Use of unauthorized formula sheets and/or notes, phones, blue-tooth enabled electronic devices during test/exam is prohibited and will be considered as cheating.

Unless specifically authorized by the instructor, the following are not allowed and are considered examples of cheating or plagiarism. The following is not an exhaustive list:

#### **A. On any examination, test, or quiz:**

1. Looking at or copying from another student's work.
2. Allowing another student to look at or copy your work.
3. Exchanging information with another student.
4. Speaking or whispering. (You may speak to the instructor at any time)
5. Opening a textbook or notebook.
6. Looking at notes, on paper, using electronic devices (e.g. phones, PDA or similar devices) and other formats.

#### **B. On homework or other out-of-class assignments:**

1. Copying work or answers from another student.
2. Copying work or answers from a book.
3. Having another person do work for you.
4. Allowing another student to use your work as his or her own.

#### **C. For late work or tests:**

Providing false information or false documents in order to be allowed to make up a missed test, quiz, or homework.

### **PREREQUISITE POLICY:**

Any student who does not meet the prerequisite(s) for this course is strongly advised to drop the course. Otherwise, the student may be administratively withdrawn with loss of tuition later. Any official waiver of prerequisites must be in writing.

### **Access and Accommodation Center (AACE)**

Students who wish to request accommodation for a disability may do so by registering with the Access and Accommodation Center (AACE) <http://access.gsu.edu/>. Students may only be accommodated upon

issuance by the Access and Accommodation Center of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

### **Title IX: Pregnant and Parenting Students Guidance**

The university has developed a guidance document for faculty and program leaders on how to respond to requests by pregnant and parenting students for class or program adjustments under Title IX. A student seeking an adjustment due to pregnancy or childbirth should discuss the request with their instructor. The instructor must grant the adjustments required by Title IX as described in this document. Instructors and students should address questions and requests for assistance to the Director of the Access and Accommodations Center at 404-413-1560. Student guidance information is available at:

<https://hr.gsu.edu/download/pregnancy-policy/?wpdmdl=6544258&refresh=5dcc17ea117aa1573656554>

### **Learning and Tutoring Center**

The LTC offers FREE walk-in tutoring and academic support at FIVE Perimeter College campuses. The LTC provides a variety of other resources and services to accommodate student needs. All LTCs are equipped with computers, instructional software and internet access. Online tutoring is also available. Please visit the LTC's website ( <https://success.students.gsu.edu/learning-tutoring-center/> ) to find information about locations, hours of operation, tutoring and workshop schedules, handouts, online tutoring, and links to online practice resources.

#### **Contacts:**

- Alpharetta Campus (room# AA-2250): Dr. Lizann Gibson, [lgibson@gsu.edu](mailto:lgibson@gsu.edu)
- Clarkston Campus (room# CB-1200): Mary Hamilton, [mhamilton@gsu.edu](mailto:mhamilton@gsu.edu)
- Decatur Campus (room# SF-1200): Sohayla Mohebbi, [smohebbi@gsu.edu](mailto:smohebbi@gsu.edu)
- Dunwoody Campus (room# NLRC-3200): Nancy McDaniel, [nmcdaniel@gsu.edu](mailto:nmcdaniel@gsu.edu)
- Newton Campus (room# 2N-3200): Arne Paulsen, [apaulsen@gsu.edu](mailto:apaulsen@gsu.edu)

### **"Incomplete" (I) Course Grade:**

A grade of "Incomplete" or an "I" will only be given only if the course has been essentially completed. for documented emergencies that occur near the end of the semester. If a student misses the final exam due to illness, injury, or other special circumstance, the student may request the "Incomplete I grade". The student must be passing to receive an "I" grade. The student must fill out the proper form, specify the missed work, and attach any appropriate documentation (such as a hospital record). No documentation is necessary for reasons related to pregnancy. If the "Incomplete" is not made up in the following semester, the "I" grade will automatically revert to an "F" grade.

### **Inclement Weather:**

If the College is closed due to inclement weather or other reasons, any scheduled tests, quizzes or examination during that period will be conducted during the next available full class period in the order of the initial schedule.

### **Tobacco and Smoke-Free Campus Policy**

[Tobacco and Smoke-Free Campus Policy](#): The University System of Georgia (USG) Board of Regents adopted a tobacco and smoke-free campus policy to make USG 100% tobacco free effective October 1, 2014. All faculty, staff, students, visitors, vendors, contractors, and all others are prohibited from using any tobacco products while on GSU property. "Tobacco Products" is defined as cigarettes, pipes, cigars, all forms of smokeless tobacco, clove cigarettes and other smoking devices that use tobacco such as hookahs or simulate the use of tobacco such as electronic cigarettes. Violations of the smoking policy will be handled under the Georgia State University Student Code of Conduct.

### **Disruptive Behavior Policy**

Disruptive behavior: [http://codeofconduct.gsu.edu/files/2016/08/Georgia-State-University\\_Student-Code-of-Conduct-2016-2017\\_08032016.pdf](http://codeofconduct.gsu.edu/files/2016/08/Georgia-State-University_Student-Code-of-Conduct-2016-2017_08032016.pdf) and <http://www2.gsu.edu/~wwwsen/minutes/2006-2007/disrpt.pdf>

### **Sexual Misconduct Policy**

<http://deanofstudents.gsu.edu/title-ix/>

### **Statement of Non-Discrimination**

Georgia State University does not discriminate against individuals on the basis of race, color, sex, religion, age, sexual orientation, gender, national origin or veteran status in employment or the administration of the program and activities conducted by Georgia State University or any of its several departments now in existence or hereafter established. Additionally, no chartered student organization may engage in discriminatory conduct whether collectively or through the actions of its individual members.

### **CAMPUS CARRY LAW**

Campus Carry Law -- Information from the University System of Georgia (USG) can be found at [www.usg.edu/hb280](http://www.usg.edu/hb280) The Campus Carry legislation allows anyone properly licensed in the State of Georgia to carry a handgun in a concealed manner on university property with noted exceptions. Information about the law can be found at [safety.gsu.edu/campus-carry](http://safety.gsu.edu/campus-carry). It is the responsibility of the license holder to know the law. Failure to do so may result in a misdemeanor charge and may violate the Georgia State University Student Code of Conduct.”

### **EQUAL OPPORTUNITY STATEMENT**

No person shall, on the grounds of race, color, sex, religion, creed, national origin, age, or disability, be excluded from employment or participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity conducted by Georgia State University - Perimeter College.

### **AFFIRMATIVE ACTION STATEMENT**

Georgia State University - Perimeter College adheres to affirmative action policies to promote diversity and equal opportunity for all faculty and students.

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## **General Education Outcomes**

### **General Education Learning Goals for the Core Curriculum:**

The learning outcomes for general education courses are available at:  
[www.gsu.edu/~wwwfhh/goals.doc](http://www.gsu.edu/~wwwfhh/goals.doc) as approved by the GSU Senate 2/13/2004.

#### **Goal I-- Communication:**

1. Students communicate effectively using appropriate writing conventions and formats.
2. Students communicate effectively using appropriate oral or signed conventions and formats.

#### **Goal II- Collaboration:**

1. Students participate effectively in collaborative activities.

#### **Goal III- Critical Thinking:**

1. Students formulate appropriate questions for research.
2. Students effectively collect appropriate evidence.

3. Students appropriately evaluate claims, arguments, evidence and hypotheses.
4. Students use the results of analysis to appropriately construct new arguments and formulate new questions.

**Goal IV- Contemporary Issues:**

1. Students effectively analyze contemporary issues within the context of diverse disciplinary perspectives.
2. Students effectively analyze contemporary multicultural, global, and international questions.

**Goal V - Quantitative Skills:**

1. Students effectively perform arithmetic operations, as well as reason and draw appropriate conclusions from numerical information.
2. Students effectively translate problem situations into symbolic representations and use those representations to solve problems.

**Goal VI - Technology:**

1. Students effectively use computers and other technology appropriate to the discipline.

**Discipline-specific Learning Outcomes:**

**Goal A1-- Communication Outcomes:**

1. Students have the ability to assimilate, analyze, and present in oral and written forms, a body of information;
2. Students have opportunities to improve their physics reading skills and writing skills through course activities, assignments, and problem solving activities;
3. Students have the ability to communicate scientific investigations and information clearly by writing clear coherent laboratory reports, using data as evidence to support conclusions.

**Learning Goal A2 -- Quantitative Outcomes:**

1. Quantitative reasoning and mathematics will be characterized by logic, critical evaluation, analysis, synthesis, generalization, modeling, and verbal, numeric, graphic, and symbolic problem solving;
2. Students develop individual and group problem-solving skills and critical thinking skills, quantitatively and qualitatively through a variety of course related activities

**Learning Goal D – Natural Sciences:**

- a. Scientific reasoning will be characterized by understanding and applying scientific method using scientific processing skills, emphasizing laboratory techniques, mathematical principles, and relating experimental design to natural phenomena.
- b. Students have the ability to recognize and apply scientific inquiry using conceptual and physical models of phenomena, emphasizing the methods of data collection, doing experiments and relating the outcomes to the relevant theories and physical laws.

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