

WELCOME TO Physics 103 “The physics of everyday phenomena”

Syllabus, Fall 2022



READ CAREFULLY, ASK QUESTIONS IF CONFUSED

Instructor: Branislav Djordjevic

office 201B Planetary Hall,
e-mail bdjordje@gmu.edu
course website: Blackboard 9
office hours: Tue, Thu, 2:00 PM – 3:00 PM (or by appointment).

You are encouraged to come visit me if you are having any problems with the course, or have questions on the material or any questions about physics in general! It would help me if we schedule a time to meet in advance, so that I can be sure to be available and plan to allow sufficient time for discussion.

Course Meeting: **lecture:** Tuesday, Thursday 12:00 PM - 1:15 PM, David King Jr. Hall 1006

lab:

| | | |
|---------|--------------------|--------|
| Monday | 10:30 PM - 1:10 PM | PH 324 |
| | 1:30 PM - 4:10 PM | PH 324 |
| | 4:30 PM - 7:10 PM | PH 324 |
| Tuesday | 1:30 PM - 4:10 PM | PH 324 |

Note: there is a **mandatory laboratory component** to this class that is required. *Make sure that you are registered for both.*

Prerequisite: Knowledge of high school algebra and geometry.

Textbook: None required. Lecture notes and all other course materials will be provided via Blackboard.

Additional materials: You'll need something to write with and on, so bring pencils or pens, notebook or paper. You may wish to bring in a calculator.

Withdrawal: If you need to withdraw from this course you must do it within the University established time frame.

Students with disabilities: Please contact The Office of Disability Services (SUB I, Room 222, Phone 703-993-2474) if you have a learning or physical disability that will require accommodation in this class. You must obtain the proper paperwork as soon as possible and contact me during the first week of classes so that I can accommodate your needs throughout the course.

Student resources: for more info go to <http://ctfe.gmu.edu/teaching/student-support-resources-on-campus/>

Academic Advising Center – 703-993-2470
 Office of Disability Services – 703-993-2474
 Math Tutoring Center – 703-993-1460

Campus Counseling Center – 703-993-2380
 Writing Center – 703-993-1200

Computer support: **Computer and/or Web support is not my responsibility.** You can find help as well as available workstations at the Johnson Center.

Purpose: Physics 103 is part of the general education program at GMU. According to the GMU catalogue the purpose of general education courses is:

“...to educate, liberate, and broaden the mind, and to instill a lifelong love of learning. In conjunction with each student’s major program of study and other electives, minors, or certificates, this program seeks to produce graduates with intellectual vision, creative abilities, and moral sensibility as well as skills to ensure a well-rounded and usable education.

General Education courses will ensure that all undergraduates develop skills in information gathering, written and oral communication, and analytical and quantitative reasoning; expose students to the development of knowledge by emphasizing major domains of thought and methods of inquiry; enable students to attain a breadth of knowledge that supports their specializations and contributes to their education in personal and professional ways; and encourage students to make important connections across boundaries—for example, among disciplines, between the university and the external world, and between the United States and other countries.”

Overview: Physics 103 is a general education natural science course, designed to help students understand the scientific process and to develop their scientific reasoning skills in the context of physics. Physics 103 has for its subject matter mechanics and thermodynamics. The class will focus on concepts, and the expression of these concepts in colloquial, mathematical, graphical, and schematic descriptions. You will be asked to show your understanding in all these ways on the exams. By the end of this term, you should have a strong conceptual understanding of the various primary topics, and be able to interpret data to support that understanding.

General course policies: In order to facilitate the optimum learning environment for your fellow students, the following behavior is expected:

- ✚ Class will start on time. Come on time, and be prepared to start working.
- ✚ This class requires active participation by you. You are expected to think, write, share, ask questions, and in general be engaged while you are here.
- ✚ My class policy is: **NO LATE COMERS AND NO LEAVING IN THE MIDDLE OF THE CLASS.** Entering and leaving in the middle of the class is extremely distracting and discourteous to your fellow students as well as to me.
- ✚ Be respectful of yourself and others in the class. Don’t talk during class about things that aren’t class related; when working in groups, keep voices to a low level so all can communicate; don’t denigrate others’ work or ideas. Give everyone in your group a chance to speak and contribute.
- ✚ You must turn off your cell phones before you enter classroom (unless there is a potential emergency involved, in which case you should inform me that such disruption may occur and sit yourself in such location in the classroom where it will affect other students the least). Anyone whose electronics disturbs the class will be penalized 1% of the overall course grade each time it happens.
- ✚ With the exception of calculators no electronic devices are to be used in class. It has been my experience that laptops and notebooks are more often than not used for web surfing, e-mail or other class unrelated purposes. Not only is this detrimental to your own progress, it is also distracting to students sitting next to or behind you. In addition, recent studies indicate that much better retention is achieved by students who take notes by hand rather than typing them. Thus, unless you can demonstrate a special need for such device, their use will not be allowed during our classes. Infractions to this policy will be penalized similarly to cellphone infractions. Whether or not you choose to keep notes by hand or just listen is up to you, but you should bring some writing implements to practice solving problems in class.
- ✚ Throughout the semester **SAVE YOUR GRADED WORK.**

Class components:

Lectures

The lectures will follow the subjects as shown in the Course Schedule at the end of this document. Attendance in this class is vital to your success. As the instructor in this course, I am the guide through the territory of physics. I will not be pouring facts into your head. **You must do the thinking and the learning: I can only assist and provide guidance and clarity.** Part of your task as a participant in this course is to help me identify the most difficult material, and to help interpret that material for your classmates. The lecture notes will not cover everything that I discuss in class. Likewise, I will not be talking about everything covered in the lecture notes, only the things I think are particularly important or confusing. **You need to read the lecture notes and go over PowerPoint lecture slides.** You are expected to spend at least twice as much time studying as you spend in class, that is, if you study efficiently. If you don't, it can be a lot longer than that.

You are responsible for all the material covered in lecture and in the lecture notes as well as in any additional resources I may assign. There will be information about supplementary reading material, videos to watch, applets to practice with. No make-up work will be given after the fact. If you must miss a class for some scheduled activity (a field trip for another class, a team event in which you are a participant, etc.), see me at least one week in advance to arrange make up work. Also, be reasonable with this privilege, I reserve the right to deny make-ups if you have already missed more than two classes.

In addition, you are responsible for any announcements (including exam information and scheduling changes) made in class. Oral announcements made in class are binding and it is your responsibility to find out what has occurred in any class you might have missed.

Homework **Late assignments will not be accepted. There are no make up homeworks.**

Homework is vital to reinforce the material you study, and to apply your new knowledge. Each week there will be one, two, or more assignments composed of questions and problems designated as pivotal to the current material. Some homework assignments will be posted on and delivered by Blackboard. Other assignments will require turning in a paper copy in class. The online assignments will not be timed and you will be allowed two attempts so that you get a chance to learn from your mistakes and do better.

Note: No questions about how to do homework will be answered by e-mail. However, I only created some of the on-line assignments last fall and would greatly appreciate you sending me an e-mail about any typos, mistakes, lack of clarity or any other issues that will inevitably arise so that I can fix them ASAP. Note also that on Mondays and I'm teaching for the better part of the day and may not get a chance to read your e-mails.

Lab **Late reports will not be accepted. There are no make up labs.**

The main purpose of the lab is to provide you with hands on experience in experimental physics. See lab syllabus for the schedule, requirements, policies, and other information. Some lab sessions, at least in part, may be used to cover lecture material, to show you some demonstrations and to enhance your problem solving skills. Two sessions are designated for test preparation. See your lab syllabus for the dates.

Exams **There are no make up exams.**

Exams will include problems, questions, interpretations of data and graphs similar to homework assignments and practice examples done in class, lab, and solved in lecture notes and handouts. Anything covered in class, lab, homework, the lecture notes, and assigned supplementary sources (including websites, applets, visualizations,

and videos), may appear on the tests. In addition tests may contain short essay questions in which you'll need to demonstrate your comprehension of the material.

Exam Schedule:

There will be three midterm tests and a comprehensive final. There are no make-up exams. If you do well on all three midterms, you don't need to take the final. The tests will be delivered via Blackboard at the College of Science Testing Center in Planetary Hall (see the link <http://ttc.gmu.edu/info.htm> for the rules and hours of operation).

| Test | Dates |
|-----------|--|
| Midterm 1 | Wednesday, Sept. 28 th – Friday, Sept. 30 th |
| Midterm 2 | Wednesday, Oct. 26 th – Friday, Oct. 28 th |
| Midterm 3 | Wednesday, Nov. 23 rd – Friday, Nov. 25 th |
| Final | Wednesday, Dec. 7 th – Friday, Dec. 9 th |

Each test will be delivered for a period of a few days. Due to the large size of this class, I recommend that you take the test as early as possible. On the last day there is always a possibility that you might not get a seat if the Center is too busy. If you miss a test, you get a zero. Also, allow plenty of time before the scheduled closing of the Testing Center in case you must wait for an available computer. The Center will close on time, and you must leave even if you have not completed the test. Bring a calculator; cell phones are not allowed.

THERE WILL BE NO SO CALLED “EXTRA CREDIT PROJECT”. That's a cop out and I'd rather you spend your time studying. So don't count on improving your grade that way. There are, however, going to be opportunities to earn extra credit points in the lab, on homeworks, and on the tests.

Honor code:

You are expected to adhere to the George Mason University student honor code:

"George Mason University shares in the tradition of an honor system that has existed in Virginia since 1842. The Honor Code is an integral part of university life. On the application for admission, students sign a statement agreeing to conform to and uphold the Honor Code. Therefore, students are responsible for understanding the provisions of the code. In the spirit of the code, a student's word is a declaration of good faith acceptable as truth in all academic matters. Therefore, cheating and attempted cheating, plagiarism, lying, and stealing of academic work and related materials constitute Honor Code violations. To maintain an academic community according to these standards, students and faculty must report all alleged violations of the Honor Code to the Honor Committee. Any student who has knowledge of, but does not report, an Honor Code violation may be accused of lying under the Honor Code."

We expect you to hold to this standard by carefully citing sources used in your work and by doing your own work on tests and individual assignments. In an environment where group work is highly valued it can be difficult to sort out what policies apply. At a minimum follow these guidelines:

- During all tests you must work alone and that includes online resources.
- Work identified as individual should be strictly your own. Submitting work of another student as your work is considered cheating.
- Students are expected to actively collaborate on assignments identified as group, e.g. in the lab or during a group quiz. In these cases all members assume responsibility for group assignments. It is important that only students who actively participate are given credit.

- Students are also encouraged to form study groups to work on homework assignments and study the course material together. The group is responsible for ensuring that all members take part, learn the material, and understand how to do the assignments and not merely copy the other members' work.
- Material that is drawn from written or electronic sources must be appropriately cited. To cut and paste from web sources without citation is considered plagiarism,

If you have questions about the meaning of any of these terms or if you are in doubt about what the above policies mean in regard to specific assignments, ask me for clarification. If you are caught cheating, you will be brought before the Academic Honor Council which may result in a failing grade in this course, a permanent mark on your transcript, suspension, or expulsion.

Grades:

In this course, you will get exactly the grade you deserve by mathematically weighted average. It is **YOUR** responsibility, not mine, to make sure you study hard enough to get the grade you want. If you have any problems come to see me **EARLY**. I will help you. I also recommend that you join a study group. If needed, get a tutor (free tutoring approved by our Department is available, and I will provide you with the information on when and where as soon as I have it). Bottom line: do not wait until the last minute.

Your grade in this class will be based on homework, quizzes and other in-class work and participation, labs, 3 midterm exams (15 % each) and a final (redemption time).

| Type of assignment | Percent |
|-------------------------------------|-----------|
| Homework and in-class participation | 35% |
| Labs | 20% |
| Tests | Total 45% |
| each | 15% |

I will **NOT** answer questions about grading at any time in class or by e-mail. If you have a question about your grades, you need to come see me in person.

Letter grade based on percentage score

Final grades will be assigned by me at the end of the semester. Your final grade in this class will not be changed under any circumstances at any time.

If you finish the term with a 92% or higher average in the course you may be, but not necessary will be, exempted from the final.

NOTE: You must pass the lab to pass the course: if you get a failing grade in the lab, you will be given a failing grade in Physics 103.

How to study – a strategy for success:

As a college student you may think that this part of the syllabus is not needed. After all, you have successfully completed twelve grades of school and, unless you are a freshman, some other college classes.

Yet, the study practices you employed, while possibly adequate for many courses, may not be well tailored to the study of science. In this class, as in any science class, full comprehension and thus ability to master the new material relies on your good grasp of the material previously covered, so systematic study is vital. If a gap develops, it is hard, and soon impossible, to bridge it – it only grows wider and wider. It's sort of like trying to follow a plot in a mystery novel after skipping several chapters. So the first message is: don't let it happen, don't let the gaps develop and grow. Regularly scheduled assignments are designed to help you keep up, but, if for whatever reason, you are having hard time understanding the material and/or doing homework, you need to act right away to remedy this situation.

| Letter grade | Percent |
|--------------|----------|
| A+ | 97-100 |
| A | 90-96.99 |
| B+ | 87-89.99 |
| B | 80-86.99 |
| C+ | 77-79.99 |
| C | 70-76.99 |
| D | 60-69.99 |
| F | below 60 |

Below please find my suggestions for best study practices in order to succeed in this class:

- ✚ Attend the classes and participate. Pay attention and ask questions whenever anything is unclear.
- ✚ After each class read the pertinent lecture notes and review the slides (in slide show mode to get the full benefit of animations). Do not wait till the weekend, do it the day of the class when things are still fresh in your memory. Use supplementary resources referenced in the lecture notes and the slides. Visit recommended websites, watch visualizations and videos, work with applets.
- ✚ If there are concepts that you feel are muddy and re-reading the relevant lecture notes and/or slides does not make them clear, get help from me and/or the tutor as soon as possible.
- ✚ Keep an updated equation sheet. This helps to summarize and distil the information and it is handy to have these equations readily available for future use on homework and tests.
- ✚ Complete the sample examples, questions, and problems in lecture notes, slides and/or supplementary handouts. Try solving them on your own without looking at the answer first.
- ✚ Do the assigned homework and make sure you understand the solutions. The most important way to learn physics is to practice solving problems. These homework assignments are there to help you. Use them. Before submitting answers, think if they make sense. It is critical that you complete and understand the assignments in order to do well on the tests. Moreover, homework is worth 30% of your final grade. If you think that you can do well in this class without doing homework, check your algebra!
- ✚ **MOST IMPORTANTLY: study systematically;** go over presented material after each class, lab, etc. Do not allow yourself to fall behind. In this class, one lecture builds upon another (or lab for that matter), so you will not be able to follow with comprehension if you skip something. This can very quickly result in a hole that grows so big it's impossible to climb out of it.
- ✚ If you have trouble following the material, do a reboot: go back to the last topic you feel comfortable with and start by re-reading it. Chances are the roots of your problem are somewhere there. If such additional review does not help, come see me or a tutor.
- ✚ If you miss a class, study the covered material as soon as possible and come to see me or a tutor for further clarification.
- ✚ **Except for the work designated to be done individually, such as exams, work in groups.** It is always very productive to discuss things with your classmates and I encourage you to form study groups to work on practice problems, homework, and to quiz each other.
- ✚ Write down questions and ask away! It is vital to your learning. Never hesitate to ask questions. There are no dumb questions, only ignorance as a result of failure to seek an answer. Your suggestions for improving the course are also requested. You have a valuable perspective on the class, and I want to hear it and learn from it.

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Tentative Course Schedule for Physics 103 Fall 2022

(subject to verification by real life)

| Week | Dates | Course Topic |
|-------------|-------------------|--|
| 1 | Aug. 23 – 25 | Introduction to Physics 103, science. |
| 2 | Aug. 30 – Sept. 1 | Motion: speed, velocity, acceleration. |
| 3 | Sept. 6 - 8 | Freefall, vectors. |
| 4 | Sept. 13 - 15 | Projectile motion, Newton's Laws, forces. |
| 5 | Sept. 20 - 22 | Newton's Laws, forces continued. |
| 6 | Sept. 27 - 29 | Newton's Laws, forces continued. |
| 7 | Oct. 4 - 6 | Work, energy. |
| 8 | Oct. 11 – 13 | (No class on Oct 11). Energy, momentum |
| 9 | Oct. 18 - 20 | Momentum continued, circular motion |
| 10 | Oct. 25 – 27 | Circular and rotational motion. |
| 11 | Nov. 1 – 3 | Gravity. |
| 12 | Nov. 8 - 10 | Thermodynamics. |
| 13 | Nov. 15 – 17 | Thermodynamics continued. |
| 14 | Nov. 22 – 24 | Thermodynamics continued. no class on Thursday (Thanksgiving) |
| 15 | Nov. 29 – Dec.1 | Thermodynamics continued. |
| | | |

I read the syllabus sheet:

(To be turned to me by Sept. 15th)

I

(print your name here)

have read the syllabus for PHYS 103 lecture and familiarized myself with course requirements.

.....

(sign here)

.....

(date)