Physics 303

Classical Mechanics

Class: MWF 1:30 - 2:20 pm, D210

Professor: G.P.Gilfoyle; Office: Gottwald Science Center, D-110; phone: 289-8255; electronic mail: ggilfoyl@richmond.edu; Office hours: MWF 2:20-3:20 pm; T 9:00-10:00 am, 3:00-4:00 pm. Other times when I'm available.

Objective: To gain a deeper understanding of natural phenomena using Newton's Laws and related methods.

Textbook: **Classical Mechanics: A Modern Perspective** by Barger and Olsson; **Mathematical Handbook** by M.R.Spiegel, Schaum's Outline Series (recommended); **Physics for Scientists and Engineers** by by R.D. Knight (recommended).

Software: *Mathematica*, (required) (to download go to `https://spidertechnet.richmond.edu/TDClient/1955/Portal/KB/ArticleDet?ID=88612`).

Webpage: `https://facultystaff.richmond.edu/~ggilfoyl/cm.html`

Prerequisites: Physics 301 or permission of the instructor.

Course Work: Each class meeting will consist of lecture, demonstration, and lab work (see SCHEDULE).

Attendance: Attendance at all classes is expected for the entire period. Unexcused absences will result in a grade of zero for any missed activity. Excessive absences will lower the final grade. An excused absence is one given by the dean, a doctor, a department, or the instructor for what is deemed to be sufficient reason provided there is adequate advanced warning (one day). A student is responsible for all work missed during an absence.

Grading: Grades will be computed on the following basis:

Written Assignments	30%
Tests	40% (20% for each of 2 tests)
Final Exam	30%

Make-up tests will not be administered. If a test is missed because of an excused absence the next test will count more to make up the loss. Unexcused absences will result in a grade of zero for the missed activity.

Homework: Homework will be assigned regularly, but only a fraction will be collected. Exams are based on these assignments. Unexcused late homeworks will be reduced by one point if not handed in during the appropriate class. An additional point will be subtracted for each subsequent day late. Once solutions are posted no homeworks will be accepted. Late submissions will be excused only at the discretion of the instructor.

Homework assignments will be listed on the course webpage (see above).

You are encouraged to discuss the homework with others, but any work handed in must be entirely your own to receive full credit.

Exams: Exams will consist of short-answer questions and problems.

Physics 303

Attendance Policy

Students should attend all classes for the full period. Those who are sick should not attend class and should inform the instructor in a timely fashion. Excessive, unexcused absences will be penalized. An excused absence is given by the instructor for sufficient reason provided there is adequate warning in a timely fashion.

- Make-up tests, quizzes, and labs will not be administered. If an activity is missed due to an excused absence the next activity will count extra to make up the loss. Unexcused absences will result in a grade of zero. The student is responsible for all missed work.
- Students must:
  - Notify instructors in advance of the absence if possible.
  - Contact the Student Health Center if sick.
  - Keep up with classwork if they are able to do so.
  - Submit assignments on time whenever possible.
  - Work with their instructors to try to reschedule any missed assignments.
  - Stay in close communication with their instructors.
- This attendance policy puts everyone on their honor. Falsely reporting a reason for an absence is an honor code violation.

Honor Code

This course is taught in accordance with the University of Richmond Honor Code, which can be accessed **here**. For each test you are required to sign a pledge to neither give nor receive unauthorized assistance during the completion of the work. You can work together on homework and problem sets, but each student must contribute to the group and materials turned in for evaluation must represent your own understanding. You are expected to treat everyone with respect.

Diversity and Inclusion

The University of Richmond is committed to developing a diverse workforce and student body and to modeling an inclusive campus community which values the expression of differences in ways that promote excellence in teaching, learning, personal development and institutional success: **inclusion.richmond.edu**.

Homework Assignments

A VERY effective way to study physics is to do the homework as the material is covered in class and then do additional problems when you study for an exam. See the course website below for the latest updates on assigned homework problems.

`https://facultystaff.richmond.edu/~ggilfoyl/cm/hw/303hwf25.html`

Electronic copies of the problems are linked to the homework assignment page. Solutions for those assigned problems can also be found on the course website at the appropriate time usually the week after they are assigned. The problems and solutions are password-protected and are solely for the use of students in Physics 309 and are not be shared with people outside this class. The solutions, in particular, are not be downloaded, printed, or archived in any way. Sharing, saving, or archiving these solutions are Honor code violations.

The sections on the website refer to the text **Physics for Scientists and Engineers** (5th edition) by Knight.

Help With Physics Homework

If you have trouble with homework help is available from me during my office hours (see page 1 of this syllabus) and at other times when I'm available. A list of the services at the Academic Skills Center (http://asc.richmond.edu, 289-8626 or 289-8956) is at the following address along with other information.

`http://asc.richmond.edu`

Course Webpage

This syllabus and the other course materials can be found on the Phys 303 webpage at the following address.

`https://facultystaff.richmond.edu/~ggilfoyl/cm.html`

You can also find this link on the Blackboard page for Physics 303.

Physics 303 Schedule

Fall, 2025

Date		Topic (Chapter)	Date		Topic (Chapter)
Aug	25	Free Fall (1)	Oct	20	Nuclear Sizes (5)
	27	"		22	"
	29	"		24	"
Sep	1	Class Day		27	"
	3	Biosensor (1)		29	"
	5	"		31	Extra-Solar Planets (6)
	8	"	Nov	3	"
	10	Molecular Vibrations (2,3)		5	"
	12	"		7	"
	15	"		10	"
	17	CO_2 Vibrations (2,3)		12	Test 2
	19	"		14	Cosmology (9)
	22	"		17	"
	24	"		19	"
	26	"		21	"
	29	"		24	"
	1	Test 1		26	Thanksgiving
Oct	3	Collisions		28	"
	6	Collisions	Dec	1	Dark Matter (9)
	8	"		3	"
	10	"		5	"
	13	Fall Break			
	15	Nuclear Sizes (5)			
	17	"			

Final Exam: 9 am - 12 noon, Tuesday, Dec 9.

SYLLABUS INSERT REGARDING ACADEMIC AND PERSONAL SUPPORT SERVICES
Hope N. Walton, Director Academic Skills

Below is a boxed statement that describes the services available from a myriad of resources. We recommend that you consider including this boxed statement in your course syllabus, on Blackboard, or perhaps on a separate handout. Of course, other support services that relate specifically to your course can also be added.

Staff members from the resources below are available for consultations about concerns related to students as well as issues related to services.

If you experience difficulties in this course, do not hesitate to consult with me. There are also other resources that can support you in your efforts to meet course requirements.

Academic Skills Center (asc.richmond.edu): Assists students in assessing their academic strengths and weaknesses; honing their academic skills through teaching effective test preparation, critical reading and thinking, information conceptualization, concentration, and related techniques; working on specific subject areas (e.g., calculus, chemistry, accounting, etc.); and encouraging campus and community involvement. Tutors will be available virtually. The on-call peer-tutors available for these appointments are listed in the Box file: On-Call Online Tutors (https://richmond.box.com/s/dpe37chr2zodr3o1amtj8omjk72v2ktb). **Email** Roger Mancastroppa (rmancast@richmond.edu) **and** Hope Walton (hwalton@richmond.edu) **for appointments in academic and life skills to request a Zoom conference.**

Boatwright Library Research Librarians: (library.richmond.edu/help/ask/ or 289-8876): Research librarians help students with all steps of their research, from identifying or narrowing a topic, to locating, accessing, evaluating, and citing information resources. Librarians support students in their classes across the curriculum and provide library instruction, tutorials, research guides, and individual help. All research support will be provided online or by appointment and students can contact a librarian for help via email (library@richmond.edu), text (804-277-9ASK), chat, or Zoom (by appointment).

Career Services: (careerservices.richmond.edu or 289-8547): Can assist you in exploring your interests and abilities, choosing a major or course of study, connecting with internships and jobs, and investigating graduate and professional school options. We encourage you to schedule an appointment with a career advisor early in your time at UR.

Counseling and Psychological Services (caps.richmond.edu or 289-8119): Assists currently enrolled, full-time, degree-seeking students in improving their mental health and well-being, and in handling challenges that may impede their growth and development. Services include brief consultations, short-term counseling and psychotherapy, skills-building classes, crisis intervention, psychiatric consultation, and related services.

Disability Services (disability.richmond.edu) The Office of Disability Services works to ensure that qualified students with a disability (whether incoming or current) are provided with reasonable accommodations that enable students to participate fully in activities, programs, services and benefits provided to all students. Please let your professors know as soon as possible if you have an accommodation that requires academic coordination and planning.

Speech Center (speech.richmond.edu or 289-6409): Assists with preparation and practice in the pursuit of excellence in public expression. Recording, playback, coaching and critique sessions offered by teams of student consultants trained to assist in developing ideas, arranging key points for more effective organization, improving style and delivery, and handling multimedia aids for individual and group presentations. Remote practice sessions can be arranged; we look forward to meeting your public speaking needs.

Writing Center (writing.richmond.edu or 289-8263): Assists writers at all levels of experience, across all majors. Students can schedule appointments with trained writing consultants who offer friendly critiques of written work.