

PHY 408: Relativity

Instructor: Professor V. J. Goldman, office: B-137 (Physics)
office hours: Tue, Thu 3 - 4 and by appointment
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Text: Bernard Schutz, A First Course in General Relativity, 2nd edition

Course organization and grading:

- Two 1.5 hour lectures per week (Frey 328 Tue, Thu 1:15 - 2:35)
- Homeworks posted on BB on Thursdays, due on due date (usually next week)
- Late HW penalty: 20% per day, so that model solutions can be posted promptly
- Exams: two Midterms (Sept 30, Nov 11 in class) and Final (Tue, Dec 14, 2:15 - 4:45)
- Exams are open book and notes (no internet); the Final is comprehensive
- Course grade = 20% HW + 20% each Midterm + 40% Final
- There is no provision for doing extra or outside work to improve your grade

Blackboard: *syllabus*; *assignments*: HWs; *documents*: solutions, exams, etc.

Course outline:

1. The principle of relativity, Minkowski space-time
2. Relativistic mechanics
3. Tensors in special relativity, stress tensor
4. Tensor calculus in curved space-time
5. Weak gravitational field approximation
6. The Einstein field equation
7. Gravitational waves
8. Field of gravitating bodies, stars, black holes
9. Applications to astrophysics and cosmology

Material will be presented primarily in lectures, readings assignments from the text, and homework problems. Lecture will cover the material to be learned, some important examples, and will direct your study from the text; however some material will be presented in class that is not in the text. Generally, students who attend the lecture do better on exams, and have better overall class experience. Thus, you should attend class, pay attention while there, and take notes over the material. You should plan on 2-3 hours of study outside of class for every lecture.

Working together: Students are encouraged to study in small groups, discuss the material and HW problems. It should be perfectly clear that each person is responsible for completing and submitting the work. It is NOT acceptable to divide the problems, when one solves problem 1 and the other problem 2. Exchange of any information between the students during an exam is unacceptable.

Note: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Services. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

http://sb.cc.stonybrook.edu/bulletin/current/policiesandregulations/policies_expectations/min_instruational_student_resp.php