Special Relativity

1391-92, 2nd semester

General Information

- Schedule: Sunday and Tuesday 1:30pm to 3pm, 8th of Bahman – 7th of Khordad
- Instructor: Mahdiyar Noorbala (`noorbala at ipm dot edu`)
- Teaching Assistant: Yasaman Homayouni (`yasaman.homayouni at gmail dot com`)
- TA section time: Sunday 12:30pm to 1:30pm
- Midterm exam date: 1st of Ordibehesht, class time
- Final exam date: Monday, 13th of Khordad, 8am

All registered students must provide an email address to receive course announcements and exam grades. Send an email to the instructor with your student number in the subject line preceded by R (R-xxxxxxxxx). Auditing students are welcome and may receive the same announcements by sending an email with "R-audit" in the subject line.

Course Description

This is an undergraduate course on Einstein's theory of special relativity. Classical mechanics and electromagnetism are prerequisites.

Topics

- Newtonian dynamics and Galilean transformations
- Problems with observations and classical electrodynamics
- Principles of special relativity
- Lorentz transformations, scalars, vectors and tensors
- Time dilation, length contraction, simultaneity and the paradoxes
- Relativistic kinematics and dynamics
- Relativistic optics
- Relativity and electrodynamics
- Relativistic classical fields

Homework and Grading

The course grade consists of homework (3 pt), midterm (7 pt) and final exam (10 pt). The exams cover disjoint parts of the course material. Textbooks or notes are not allowed but a sheet of needed formulas will be handed to you, if necessary. If you have a regrade request, please submit your exam together with a cover page explaining your complaint to the TA. The entire exam will be regraded and the new grade is final.

Problem sets will be posted on Sundays and are due next week's Tuesday in class. Although an integral part of the lectures, the in-class exercises do not count toward the homework grade. Late homework is not accepted.

References

- S. Khosravi and R. Mansouri, "Special Relativity," [Farsi], Tehran, Iran: Sharif Univ. Pr. (1389)
- W. Rindler, "Relativity: Special, general, and cosmological," Oxford, UK: Univ. Pr. (2006)
- W. Rindler, "Introduction to Special Relativity," Oxford, UK: Univ. Pr. (1982)