SI2371 - Special relativity, 6 hp

Course PM - HT16

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1 Course contact details

Course lecturer and examiner: Mattias Blennow (A4:1047, `emb@kth.se`)
Teaching assistant: Daniel Weston (A4:1085, `weston@kth.se`)
Course homepage: `https://www.kth.se/social/course/SI2371/`

2 Course literature

The course is based on:

- W. Rindler, *Introduction to Special relativity* 2nd ed, Oxford University Press (1991).

Other recommended reading:

- Schutz, *A first course in general relativity*, Cambridge University Press (1985) – also contains a well written introductory part on special relativity
- Schwarz and Schwarz, *Special Relativity, From Einstein to Strings*, Cambridge University Press (2004) – A more formal treatment including more general coordinates and some advanced topics
- Mickelsson, Ohlsson, Snellman, *Relativity theory*, KTH (2005) – course compendium in old course
- Ramgaard, Blennow, Ohlsson, *Tensoranalys*, KTH (2004) – in Swedish – more detailed text on tensor analysis and notation

3 Prerequisites

The following courses are recommended prerequisites:

- Vector analysis
- Electromagnetic theory
- Mathematical methods in physics

4 Course requirements

Exam (TEN1; 6 hp). Graded A-F, where E is the lowest passing grade.

4.1 Examination

See the course schedule on the course homepage for the time of the exam and re-exam.

Allowed aids: Students will be allowed to bring one A4 page on which anything may be written (on both sides) to the exam. No other aids will be allowed.

The exam will consist of 6 problems where each problem will be graded A–F according to the following scheme:

A The student has presented solutions to all parts of the problem. The solutions are clearly motivated and correct. Minor obvious typos can be accepted.

B The student has solved all or most of the problem correctly. Minor issues with missing motivation and computational errors can be accepted as long as they do not lead to physical inconsistencies. Faulty arguments and inconsistent results can be accepted only if the remainder of the solution is essentially flawless.

C The student's solutions treat most of the problem and is largely correct but may contain computational errors and lack motivation of a few steps. Faulty arguments and inconsistent results can be accepted to a minor degree.

D The student has demonstrated a basic understanding for all parts of the problem as well as the underlying concepts. The student has made significant progress towards a solution of a large part of the problem. Faulty arguments and inconsistent results can be accepted to a more extended degree as long as the basic idea is correct.

E The student's solution demonstrates a basic understanding of the major issues and concepts treated in the problem. The student has attempted to make proper progress towards a solution to the problem.

F None of the above apply. This includes unreadable solutions, blank solutions, and solutions containing what is basically just a repetition of the problem formulation.

4.2 Final grade

The different grades are: A, B, C, D, E, Fx, and F. The grade is based on the result of the exam. The given grade will be the highest grade for which the following is true:

- The student has obtained *at least* that grade on 4 out of 6 problems in the exam.
- The student has obtained *at least* a grade no more than two grades lower on *all* problems in the exam.
- For all passing grades (E and higher), the student has obtained *at least* an E on *all* exam problems.

Example: Kim has gotten the following exam result: ABBCDD. Kim will get the final grade C since 4 problems have grade C or better and all problems have grade E or better. Kim will not get a B since there are only 3 problems with grade B or better. However, had Kim's C been a B, Kim would have gotten a B, since all problems have been graded D or better.

4.2.1 Fx

Students who obtain passing grades on 5 out of 6 exam problems will be given the grade Fx and provided with an opportunity to do an extra assignment in order to complete their grade to an E. This will be done in accordance with the KTH rules on such procedures. In case you have been given an Fx and want to do the extra assignment, contact the examiner as soon as possible.

5 Test exam

During the course a test exam will be handed out. The test exam is split into two parts that can be solved by the students and handed in before deadline during the course. The solutions to the test exam will be discussed in class after the deadlines. The formulation of the test exam will be posted on the course homepage. The deadlines for handing in the solutions are:

Set1: 2016-11-25 @ 10.15
Set2: 2016-12-16 @ 10.15

These deadlines are sharp as the solutions will be discussed in class starting at those times.

The test exam is an optional, but strongly recommended, part of the course. The problems are designed to be essentially equivalent to those of an exam and participation will provide you with a possibility to learn the subject better, familiarize yourself with the grading system, and allow you to obtain partial credit towards passing the course and/or receiving a higher grade. Each part of the test exam will be graded according to the same rules as the final exam.

The test exam should be handed in in PDF format through the peergrade.io website. Scanned copies of handwritten solutions are fine, but the solutions must be easily readable. Low-contrast or otherwise low-quality photographs will not be accepted. If you have not obtained an invitation to Peergrade and wish to do the test exam, contact Mattias via e-mail. The test exam will be both

peer corrected and corrected by a teacher. After the deadlines, the Peergrade software will automatically assign you two students' solutions to grade. The peer grading must be completed within a week from the corresponding deadlines. Only the teacher corrections will affect the partial credit.

5.1 Partial credit

Students who participate in the test exam may receive partial credit for their solutions. *Up to two* problem grades from the test exam may replace the *corresponding* problem grades from the exam (i.e., the grade on the first problem on the exam may be replaced by the grade on the first problem of the test exam and so on). This will be done as beneficial to the student as possible.

Example: Kim's original disappointment in the exam result disappears when Kim realizes that one of the problems which received a D on the exam was graded A in the test exam. Thus, Kim can replace that D with the A from the test exam in order to have the result AABBCD, which gives Kim an overall B.

In order to obtain grades from the parts of the test exam, the student *must* participate in the peer correction on `peergrade.io`. If you participate only in the peer correction only for one set of problems, only those problems can obtain partial credit in the exam.

6 Program and schedule

The most updated schedule for the course lectures and TA classes can be found on the course homepage. We also refer to the homepage for the lecture and TA class program.