



Special Relativity: a Constructive Approach

ELTE BTK FI syllabus, Fall of 2026/2027

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1. Course description

The course gives an epistemically motivated, constructive introduction to the theory of special relativity that does not start with postulating principles or physically uninterpreted geometrical structures and pays attention to operational verifiability of the assumptions. The course develops the standard kinematic results (relativity of simultaneity, length contraction, time dilation, invariant intervals, and so on), and discusses how they relate to the dynamical behavior of rods and clocks, a speed that limits causal processes, a background metric, the Light Postulate, the Relativity Principle, and the Clock Hypothesis. To the extent time permits, we also dive in to the literature on the foundations of relativity theory.

2. Requirements

The course can be taken at two different levels: introductory and advanced. The introductory level only assumes high-school background; in particular, the lectures focus on conceptual development and avoid mathematical derivations. The course can thus be taken by philosophy undergraduates/graduates without physics background. For those students who wish to take the course at an advanced level (especially for students who pursue a degree in physics), precise mathematical resources will be made available and referenced throughout the course.

The course closes with an oral exam: the students tell the instructor whether they wish to take the exam at the introductory or at the advanced level, draw a card which contain a topic covered during the semester, and after a half hour of preparation (with access only to pen and paper) they share their understanding of the topic with the instructor.

3. General remarks

Classes will be held *offline*, on Thursdays between 14:00-15:30, in room 224 of the I building (BI-2-224) of ELTE at Astoria.

The lectures are in English and sufficient reading/speaking skills are expected. The instructor makes the lecture notes and readings available.

Any use of electronic devices or attempt at consulting extracranial resources during the oral exam will lead to an automatic failing grade.