

電気通信大学 平成21年度シラバス

授業科目名	Modern Physics		
英文授業科目名	Modern Physics		
開講年度	2009年度	開講年次	3、4年次
開講学期	前学期	開講コース・課程	昼間コース
授業の方法	講義	単位数	2
科目区分	総合文化科目-国際科目-		
開講学科・専攻	情報通信工学科 情報工学科 電子工学科 量子・物質工学科 知能機械工学科 システム工学科 人間コミュニケーション学科		
担当教官名	Pham Le Kien (ファム リ キエン)		
居室	東6-606		

公開E-Mail	授業関連Webページ
fam@kiji.pc.uec.ac.jp	

【主題および達成目標】
<p>The theory of special relativity and the theory of “ quanta ” emerged at the turn of the 20th century as a fundamental framework for understanding macroscopic and microscopic aspects of the world. The theory of special relativity treats problems related to space and time. The quantum mechanics treats problems related to the building blocks of our world, namely atoms, molecules, and subatomic particles. This course consists of a series of lectures on the theory of special relativity and quantum mechanics. It presents basic concepts required of all branches of modern physics. The focus however is on ideas rather than on technical details or practical applications.</p>

【前もって履修しておくべき科目】
N/A

【前もって履修しておくことが望ましい科目】
N/A

【教科書等】
Concepts of Modern Physics by Arthur Beiser (McGraw-Hill, sixth edition, New York, 2003).

【授業内容とその進め方】

List of Topics

This course consists of a series of lectures on the following topics:

- 1) Length contraction
- 2) Time dilation
- 3) Relativistic mass
- 4) Doppler shift
- 5) De Broglie waves
- 6) Particle diffraction
- 7) Uncertainty principle
- 8) Atomic spectra
- 9) Correspondence principle
- 10) The laser
- 11) Wave equation: the Schroedinger equation
- 12) Particle in a box
- 13) Tunnel effect

【授業時間外の学習（予習・復習等）】

Full lecture notes, brief summary of key points, and homework will be given after each lecture.

【成績評価方法及び評価基準(最低達成基準を含む)】

At the end of the course, each student has to write a short report (at most 2 A4 pages) on a topic from the list. In the report, the student should show his understanding of the topic.

Assessment in this class will take account of the attendance, discussion, and report at the score proportion of 20%, 30%, and 50%, respectively.

In order to get the credit of the course, the student has to understand the basic concepts of special relativity and quantum mechanics. The student must understand at least 60%, 75%, or 90% of the listed topics to get the mark C, B, or A, respectively.

【オフィスアワー：授業相談】

- 1) Write email messages to me.
- 2) Come to my office, Monday through Friday, 10:00 to 12:00 and 14:00 to 17:00.

電気通信大学 平成21年度シラバス

【学生へのメッセージ】
N/A

【その他】
N/A