Concepts of Physics from Historical Perspectives

CATHOLIC UNIVERSITY OF KOREA

Course Syllabus

2014학년도 제2학기

Course Title	Korean	물리학의개념과역사			
	English	Concepts of physics from historical perspectives			
Course Number-Division	04849-01	Course Completion Requirement	제1전공선택	Time/Credits	3/3
Day / Time	월2~3(V204), 금 3(V204)	Course Target Audience		Prerequisite Courses	
Professor	Full Name	Office	Phone Number	E-MAIL	
	마크앤클리프	D327	02-2164-4841	mark.ancliff@gmail.com	
Web Site			English Class		

1.Course Outline

This course will give an an overview of the historical development of science and the origins of current physical concepts and theories. We will focus on questions like 'how are physical theories discovered and tested?', 'what do physical concepts and theories tell us about the real world', 'why is the scientific method successful?' etc.. This will involve looking at historical examples of how discoveries were made and how theories were formed, as well as a discussion of the philosopy of science.

2. Objectives

This class aims to give students an understanding of how physics has progressed through history and how we can expect it to progress in future. Different from other physics courses, we will not focus on any particular area of physics, but rather will consider general questions about the nature of the scientific method. Only basic physics knowledge is necessary to take this course.

3. Teaching Method

The first half of the course will be based on 'The Character of Physical Law', a series of lectures given by Feynman in the 1960s. Each week will focus on a separate lecture, and will explore the ideas raised in Feynman's lecture in more detail.

The second half of the course will give an introduction to the philosophy of science. There will be time for discussion each week. Students will also give presentations on important scientists throughout history and the contributions they made.

4. Evaluation Method

Attendance 10%
Participation 10%
Presentations 20%
Midterm Exam 20%
Final Exam 40%

Notes:
- The midterm exam will be quite short and involve multiple-choice questions and questions needing single sentence answers. The final exam will include a multiple choice section and a section requiring longer written answers (a couple of paragraphs per question - IN ENGLISH).

5. Assignments

Watching the Feynman lectures, preparing for the presentations.

6. Experiment, Practical Exercise

None

7. Related Courses

8. Textbook

Book Title	Publisher	Author	Year	Textbook or not
The Philosophy of Science: A very short introduction	Oxford University Press	Samir Okasha	2002	교재
The Character of Physical Law	MIT Press	R. P. Feynman	2001	교재

9. Detailed Weekly Activities

Week	Date	Lecture Content	Reference Material	Remarks
1	2014-09-01 ~ 2014-09-07	Class introduction Screening of 'The Character of Physical Law 1: The Law of Gravitation - an example of a physical law'		
2	2014-09-08 ~ 2014-09-14	I. THE CHARACTER OF PHYSICAL LAW 1. The Law of Gravitation - an example of a physical law		
3	2014-09-15 ~ 2014-09-21	2. The relation of mathematics and physics		
4	2014-09-22 ~ 2014-09-28	3. The great conservation principles		
5	2014-09-29 ~ 2014-10-05	4. Symmetry in physical law		
6	2014-10-06 ~ 2014-10-12	5. The distinction of past and future		
7	2014-10-13 ~ 2014-10-19	6. Probability and uncertainty - the quantum mechanical view of nature		
8	2014-10-20 ~ 2014-10-26	MIDTERM EXAM		
9	2014-10-27 ~ 2014-11-02	7. Seeking new laws		
10	2014-11-03 ~ 2014-11-09	STUDENT PRESENTATIONS (date may be changed)		
11	2014-11-10 ~ 2014-11-16	II. THE PHILOSOPHY OF SCIENCE The nature of scientific knowledge - The problem of induction - Attempts to justify induction through probability or causality		
12	2014-11-17 ~ 2014-11-23	The nature of explanation		
13	2014-11-24 ~ 2014-11-30	Karl Popper and falsificationism		
14	2014-12-01 ~ 2014-12-07	Scientific realism versus anti-realism		
15	2014-12-08 ~ 2014-12-14	Thomas Kuhn and the structure of scientific revolutions		
16	2014-12-15 ~ 2014-12-21	FINAL EXAM		