PHY3021 Nuclear and Particle Physics
Introduction

Nuclear Physics

This part of the course follows on from the Nuclear Physics of PHY2085, studying in particular nuclear forces, nuclear processes and nuclear reactions.

Particle Physics

This part of the course follows on from the earlier work on Nuclear Physics, studying the nature and behaviour of the elementary particles out of which are constructed all the various objects with which we interact.

The two components of the course are actually fairly distinct, though there are topics such as parity violation in beta decay where they are linked.

Contents

Nuclear Physics

Particle Physics

6. Quarks: the basic idea
7. Quarks and leptons in the standard model
8. Unification of weak and electromagnetic interactions
9. C, P and T symmetries
10. Beyond the standard model
11. Elementary particles and cosmology

Assignments

There will be four assignments on the course, due in on 2nd March, 16th March, 30th March and 4th April.

Books

The books most used in the preparation of this course have been

Richard Dunlap, An Introduction to the Physics of Nuclei and Particles (Brooks/Cole)

Robert Eisberg and Robert Resnick, Quantum Physics (Wiley)

Other books include:

Krane	Introductory Physics	Wiley
Gottfried and Weisskopf	Concepts of particle physics	Oxford
Perkins	Introduction to High Nuclear Energy Physics	Addison-Wesley
Wong S S M	Introductory Nuclear Physics	Prentice Hall
Allday J	Quarks, Leptons and the Big Bang	IoP
Das A and Ferbel T	Introduction to Nuclear and Particle Physics	Wiley
Elton	Introductory Nuclear Theory	Pitman
Enge	Introduction to Nuclear Physics	Addison-Wesley
Veltman	Facts and mysteries in elementary particle physics	World Scientific
Schopper	Weak Interactions and Nuclear Beta Decay	N Holland
Watson	The Quantum Quark	Cambridge University Press