

## Particle Physics

School of Physics and Astronomy

College of Engineering and Physical Sciences

### Details

**Code** 19780

**Level of study** Third/Final year

**Credit value** 10

**Semester** 2

### Module description

Students who have not attended the Y1 Quarks and Leptons lectures should read the particle physics chapters from the book Quarks, Leptons and the Big Bang by J. Allday (2nd edition, ISBN 0750308060), before attending this module.

At the most fundamental level, all matter is made from twelve types of elementary fermions (quarks and leptons) and all forces are due to the exchange of elementary bosons (photons, W, Z, gluons). The sub-nuclear world can be explained in a remarkably simple way, known as the Standard Model of Particle Physics. This module introduces the most important ideas from this Standard Model. We will also discuss some of the experimental evidence that supports the Standard Model, notably that resulting from the Large Electron-Positron (LEP) Collider at CERN. Topics covered will include the classification of particles and the quark model, quark flavours and colours, quantum chromodynamics and gluons, strong and weak decays, conservation rules, parity and charge-conjugation, charmonium, electroweak interactions and the Higgs particle.

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