

# PH1530: Particle Physics

## ***Learning Outcomes:***

After this course you are expected to:

- Be able to list the four fundamental forces, their range and mediating particles.
- Define the terms lepton, hadron, baryon, meson, boson and fermion and give an example of each.
- List the six leptons.
- List the six quarks and their charges.
- Know what is meant by lepton number, baryon number.
- Be able to assign lepton and baryon numbers to a particle.
- Know the absolute conservation laws and be able to use them to determine whether a decay is expected to occur.
- Know what is meant by the term strangeness.
- Understand how to draw an eightfold way diagram and explain its significance.
- Be able to determine the quark content of a hadron if given its properties.
- Explain what is meant by the term colour.

## ***Reading:***

All references refer to Young and Freedman, 'University Physics with Modern Physics', 11<sup>th</sup> Edition.

(Optional problems on the material in these chapters can be found at the end of the relevant chapter).

- Section 44.1 – Fundamental Particles – A History
- Section 44.3 – Particles and Interactions
- Section 44.4 – Quarks and the Eightfold Way
- Section 44.5 – The Standard Model and Beyond