

Mathematical Physics Final Honours and Diploma

Particle Physics (MP466)

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Textbooks:

1. M. Thomson, Modern Particle Physics, (2013) Cambridge University Press
2. A. Bettini, Introduction to Elementary Particle Physics, 2nd Edition (2014) Cambridge University Press.
3. B.R. Martin, Nuclear and Particle Physics: an introduction, (2006) Wiley
4. B.R. Martin and G. Shaw, Particle Physics, 2nd Edition, (1997) Wiley

Topics:

1. Introduction to Forces and Particles: the four forces; classification of leptons, hadrons, mesons, baryons.
2. Basic Concepts: cross-section, scattering amplitudes, resonances.
3. Symmetries and Conservation Laws: conservation of energy, momentum and angular momentum; discrete symmetries; C, P and T, electric charge, baryon number, lepton number, strangeness; isospin
4. The Quark model of hadrons: quark model of mesons and baryons; charm (J/Ψ); the top and bottom quarks
5. Chromodynamics: QCD; asymptotic freedom
6. Weak Interactions: electro-weak interactions; neutrino masses; the Higgs boson