Mathematical Physics
Final Honours and Diploma

Particle Physics (MP466)

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Textbooks:

1. B.R. Martin, Nuclear and Particle Physics: an introduction, (2006) Wiley 539.7 MAR
2. B.R. Martin and G. Shaw, Particle Physics, 2nd Edition, (1997) Wiley 539.72 MAR
3. F. Halzen and A.D. Martin, Quarks and leptons : an introductory course in modern particle physics, (1984) Wiley 539.721 HAL
4. D.H. Perkins, Introduction to High Energy Physics, 4th Edition (2000) Cambridge University Press 539.7 PER

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