PC3261: Classical Mechanics II

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NUS National University of Singapore

Department of Physics
Faculty of Science

Lecture 0: Course Briefing

About course

- PC3261 – Classical Mechanics II
- 4 units
- Prerequisites: (PC2032 or PC2132) and PC2174A or departmental approval
- Preclusions: -

About myself

- Contact
  - Kenneth HONG Chong Ming (call me Kenneth)
  - Office: S16-07-06
  - Email: phyhcmk@nus.edu.sg
- Education
  - <1998: primary, secondary and pre-university in Malaysia
  - 1998–2002: B. Sc. and B. Sc. (Hons.), Physics, NUS
  - 2002–2006: M. Sc. (part time), Physics, NUS
  - 2007–2013: Ph. D. (part time), Physics, NUS
- Employment
  - 2002–2006: teaching assistant, Physics, NUS
  - 2007–2014: instructor, Physics, NUS
  - 2015–2019: lecturer, Physics, NUS
  - 2020–now: senior lecturer, Physics, NUS

About syllabus

Official syllabus

This elective course assumes knowledge of and is a sequel to PC2032. A good command of calculus and linear algebra is desirable. It is intended for students who wish to acquire a deeper understanding of our Mechanical Universe. It considers the principles of relativistic, Lagrangian and Hamiltonian mechanics, and aims to establish a bridge to the principles of modern Physics. Topics covered include: dynamics with central forces, bound and unbound orbits, scattering; relativistic kinematics and dynamics of a particle, Lorentz transformations, four-dimensional notations; Lagrangian mechanics, the action principle, Euler-Lagrange equation; Hamiltonian mechanics.

About course structure

- ∼20 lectures, Tuesday/Friday 12–2pm S16-04-36
  - incomplete slides (before lecture) and complete slides (after lecture) will be uploaded to Canvas
- ∼20 in-class worksheets (LectureACT)
  - completed worksheets in PDF format are to be submitted to Canvas
- ∼8 assignments
  - answer scripts in PDF format are to submitted to Canvas
- 1 test: 21 March (week 9)
  - closed book with one A4-sized helpsheet
- 1 exam: 2 May 2:30–4:30pm
  - closed book with one A4-sized helpsheet

About references

- "Classical dynamics of particles and systems", 5th edition, Stephen T. Thornton and Jerry B. Marion, Cengage Learning, 2003
- "Analytical mechanics", Grant R. Fowles and George L. Cassiday, 7th edition, Cengage Learning, 2004
- "Classical mechanics", Tom W. B. Kibble and Frank H. Berkshire , 5th edition, Imperial College Press, 2004

About assessments

- Test: 15%
- LectureACT: 15%
- Assignments: 45%
- Exam: 25%