

# ENGR 2023 ADVANCED ENGINEERING PHYSICS 2

**Credit Points** 10

**Legacy Code** 301351

**Coordinator** Ali Hellany (<https://directory.westernsydney.edu.au/search/name/Ali Hellany/>)

**Description** This subject will be offered at Engineering Innovation Hub - Hassall St, Parramatta campus. The aim of the subject is to introduce students to topics such as electricity, magnetism, induction and semiconductivity, and to equip them with mathematical approaches for solving problems in these areas. Content in this subject will be delivered via the combination of lectures, tutorials and practicals in order to foster in students the growth of theoretical and applied physics knowledge. Students completing this subject will have a solid foundation upon which to base their continued engineering studies.

**School** Eng, Design & Built Env

**Discipline** Engineering and Related Technologies, Not Elsewhere Classified.

**Student Contribution Band** HECS Band 2 10cp

Check your fees via the Fees ([https://www.westernsydney.edu.au/currentstudents/current\\_students/fees/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Undergraduate Level 2 subject

**Pre-requisite(s)** ENGR 1047

**Co-requisite(s)** MATH 1035

## Learning Outcomes

1. Identify and explain the fundamental physical principles and laws relating to electricity, magnetism, physical optics, introductory quantum physics, and solid state physics.
2. Apply mathematical techniques to solve physics problems concerning electricity and magnetism, physical optics, and introductory quantum physics and solid state physics.
3. Execute experimental activities of a fundamental nature.
4. Competently report aims, method, analysis and findings on experimental activities.

## Subject Content

1. Electricity and Magnetism: Coulomb's Law, Electric Fields, Gauss's Law, Electric Potential, Capacitance, Magnetic Fields, Magnetic Field's due to currents, Induction and Inductance,
2. Physical Optics: Electromagnetic Waves, Interference, Diffraction
3. Introductory Quantum Physics and Solid State Physics: Photons, Electrons and Atoms, Photos and Matter Waves, Conduction and Electricity in Solids.

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Practical	1,000 words (per report), 3 hours (practical exam)	20	N	Individual
Report	1,000 words with illustrations	20	N	Group
Quiz	45 minutes (per Quiz)	30	N	Individual
Professional Task	1,000 words (15%); 3 x A3 size annotated concept development (15%)	30	N	Individual
Final Exam	2 hours	50	N	Individual
Presentation	1,250 words (20%); Final proposal (20%) 7 minutes Presentation (10%)	50	N	Individual

## Prescribed Texts

- Young, HD, Freedman, RA, Ford, AL & Estrugo, KZ 2020, Sears and Zemansky's university physics : with modern physics, 15th global SI edn, Pearson Education, Harlow.