

| Maklumat Terperinci Setiap Mata Pelajaran | | | | | | |
|---|---|--------------------|---|---|----|-----|
| 1. | Nama Mata Pelajaran: Electromagnetism | | | | | |
| 2. | Kod: UEEP2053 | | | | | |
| 3. | Taraf: Teras Major | | | | | |
| 4. | Jam Kredit : 3 | | | | | |
| | 3.8 mewakili kuliah: (4 jam x 14 minggu) 0.2 mewakili tutorial: (1 jam x 8 minggu) | | | | | |
| 5. | Tahun diajar : 2 | | | | | |
| 6. | Prasyarat (sekiranya ada) : UEEP1043 Electricity and Magnetism | | | | | |
| 7. | Kaedah penyampaian / pengendalian : Kuliah dan Tutorial | | | | | |
| 8. | Sistem penilaian dan pecahan markah : | | | | | |
| | Tugasan / Ujian | | | | | 40% |
| | Peperiksaan Akhir | | | | | 60% |
| 9. | Guru yang mengajar: Asst. Prof. Dr. Lim Eng Hock, PhD (Electronic Engineering), MEng (Electronic Engineering), BSc (Electronic Engineering) | | | | | |
| 10. | Objektif mata pelajaran : The main objective of the unit is to introduce the technique of analytical geometry, vector analysis and calculus in solving the problem related to electromagnetism, which is one of the most important subjects for physics students. In addition, the subject also touches on the electromagnetic waves and its propagation through transmission line as well as wave guides. | | | | | |
| 11. | Hasil Pembelejaran: After completing this unit, students will be able to: 1. Solve the problem on electromagnetism using the technique of analytical geometry, vector analysis and calculus. 2. Describe the electromagnetic wave using Maxwell Equation. 3. Understand the characteristics of transmission lines and waveguide. 4. Describe the radiation characteristics of antenna in the far-fields. | | | | | |
| 12. | Sinopsis mata pelajaran : This unit provides a comprehensive treatment of electromagnetism. It covers the following topics Faradays Law's, Electromagnetic wave, Transmission line and Wave guides. | | | | | |
| 13. | Topik and Nilai Jam Kontak: | | | | | |
| | Kandungan | Hasil Pembelajaran | L | T | SL | TLT |
| Tajuk 1 | Time-varying Fields <ul style="list-style-type: none"> Review of vector calculus. Faraday's Law of Induction. the conservation of charge and the incompleteness of Ampere's Law. Maxwell's equations and Lorentz force law. | 1, 2 | 6 | 1 | 8 | 15 |
| Tajuk 2 | Electromagnetic Waves <ul style="list-style-type: none"> Uniform plane waves and wave equation. Time harmonic fields. Polarization of waves, Poynting's Theorem and the conservation of energy. The field definitions of impedance, admittance. | 1, 2 | 8 | 1 | 11 | 20 |

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|--|---|---|----|---|----|-----|
| Tajuk 3 | <ul style="list-style-type: none"> Phase and group velocities. Waves in media: lossy media, dispersive media, Wave reflection and transmission at normal and oblique incidences <p>Transmission Line Theory</p> <ul style="list-style-type: none"> Distributed element model, transmission line equations. Wave propagation on a transmission line. Input impedance of the lossless line, power flow on a lossless transmission line. Smith chart. Transients on transmission lines. Microstrip transmission line. | 3 | 11 | 1 | 14 | 26 |
| Tajuk 4 | <p>Waveguides and Cavity Resonator</p> <ul style="list-style-type: none"> Properties of waves in rectangular waveguides. Modes of propagation, phase and group velocities in waveguide, wave impedance. Cavity resonators and field distribution. | 3 | 6 | 1 | 8 | 15 |
| Tajuk 5 | <p>Antenna Theory</p> <ul style="list-style-type: none"> Antenna, Hertzian dipole, Half-wave dipole antenna, Quarter-wave monopole antenna, small loop antenna. Antenna characteristics. Antenna patterns, radiation intensity, directivity gain, power gain. Antenna arrays. Effective area, Friis' equation. Radar equation. <p>Assessment:</p> <ul style="list-style-type: none"> Assignment Tests Final Exam | 4 | 6 | 1 | 8 | 15 |
| | | | | | 30 | 30 |
| Jumlah jam Notional | | | 37 | 5 | 79 | 121 |
| Jam Kredit | | | 3 | | | |
| *Tutorial 5 contact hours (1 hour for every alternate week). | | | | | | |

Sumber Rujukan Utama:

1. Sadiku, Matthew N.O. (2007). *Elements of electromagnetics*. (4th ed.). Oxford University Press, ISBN 0195300432.

Sumber Rujukan Tambahan:

1. Paul, Clayton R. (2004). *Electromagnetics for engineers: with applications to digital systems and electromagnetic interference*. (International ed.). John Wiley & Sons, ISBN 0471452459.
2. Ulaby, Fawwaz T. (2004). *Fundamentals of applied electromagnetics*. Pearson, ISBN 013185089x.
3. Iskander, M. F. (2000). *Electromagnetic fields and waves*. Long Grove, Ill.: Waveland Pr Inc.