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| UNIVERSITI MALAYA | **MAKLUMAT KURSUS UNTUK SEMESTER/PENGGAL SEMASA**<br>***COURSE INFORMATION FOR CURRENT SEMESTER/TERM*** |

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| Sesi Akademik<br>*Academic Session* | 2020/2021 |
| Semester/Penggal<br>*Semester/Term* | 2 |
| Kod Kursus<br>*Course Code* | KIE4017 |
| Tajuk Kursus<br>*Course Title* | Pandu Gelombang Optik<br>*Optical Waveguides* |
| Bahasa Pengantar<br>*Medium of Instruction* | Bahasa Inggeris<br>*English* |
| Rujukan Utama<br>*Main Reference* | 1. Robert Hunsperger, "Integrated Optics: Theory and Technology", Springer, 2009.<br>2. Gines Lifante, Integrated Photonics: Fundamentals, Wiley, 2005.<br>3. Ghatak, Thyagarajan, Introduction to Fiber Optics, Cambridge Press, 2005.<br>4. Ilzuka, Elements of Photonics – Volume II, Wiley, 2002.<br>5. Hecht, Optics, Prentice Hall, 2016. |
| Strategi Pembelajaran<br>*Learning Strategies* | Kuliah, Seminar, dan Perbincangan Kumpulan<br>*Lectures, Seminar and Group Discussion* |
| Masa Pembelajaran Pelajar<br>*Student Learning Time* | Bersemuka / *Face to face* : 31<br>Tidak Bersemuka / *Non Face to face*: 0<br>Masa Persediaan Pelajar / *Student Preparation Time*: 50 |
| Kemahiran Boleh Pindah<br>Transferable Skills | Kemahiran Menyelesaikan Masalah, Kemahiran Analisa<br>*Problem Solving Skills, Analytical Skills* |
| Pensyarah / *Lecturer*<br><br>Bilik / *Room*<br><br>Telefon/e-mel<br>*Telephone/e-mail* | Prof. Dr. Faisal Rafiq Mahamd Adikan<br><br>Tingkat 1, Jabatan Kejuruteraan Elektrik<br><br>03-7967 7700 / rafiq@um.edu.my |
| Sesi Kuliah / *Lecture Session:*<br><br>Hari/Masa / *Day/Time*<br><br>Tempat / *Venue* | Rujuk kepada myum.um.edu.my.<br><br>*Refer to* myum.um.edu.my. |
| Sesi Tutorial/Amali:<br>*Tutorial/Practical Session:*<br><br>Hari/Masa / *Day/Time*<br><br>Tempat / *Venue* | Tiada<br><br>*No* |
| Perincian Pemberatan Penilaian<br>*Detail of Assessment Weightage* | Penilaian Berterusan / *Continuous Assessment* : 40%<br><br>Peperiksaan Akhir / *Final Examination* : 60% |

**Jadual Pengajaran / *Teaching Schedule***

| Minggu<br>*Week* | Topik & Aktiviti<br>*Topic & Activities* | Rujukan<br>*References* |
|---|---|---|
| 1 | Pengenalan kepada pandu gelombang optik – gentian optik<br>*Introduction to optical waveguides – optical fiber* | *Ref [1-5], lecture note* |
| 2 | Pengenalan kepada pandu gelombang optik – pandu gelombang satah<br>*Introduction to optical waveguides – planar waveguide* | *Ref [1-5], lecture note* |
| 3 | Pengenalan dan ulasan: Persamaan Maxwell dan syarat-syarat sempadan<br>*Introduction and review: Maxwell equations and boundary conditions* | *Ref [1-5], lecture note* |
| 4 | Mod bagi pandu gelombang<br>*Modes of optical waveguides* | *Ref [1-5], lecture note* |
| 5 | Pemalar perambatan, indeks berkesan, profil mod<br>*Propagation constants, effective index, mode profiles* | *Ref [1-5], lecture note* |
| 6 | Kaedah-kaedah fabrikasi pandu gelombang optik (Bahagian 1)<br>*Fabrication methods for optical waveguides (Part 1)* | *Ref [1-5], lecture note* |
| 7 | Kaedah-kaedah fabrikasi pandu gelombang optik (Bahagian 2)<br>*Fabrication methods for optical waveguides (Part 2)* | *Ref [1-5], lecture note* |
| 8 | Gentian optik istimewa – gentian hablur fotonik<br>*Specialty optical fibers – photonic crystal fibre* | *Ref [1-5], lecture note* |
| 9 | Gentian optik istimewa – gentian leper<br>*Specialty optical fibers – Flat Fibre* | *Ref [1-5], lecture note* |
| 10 | Alat berangka bagi analisa dan rekabentuk pandu gelombang (Bahagian 1)<br>*Numerical tools for optical waveguide analysis and design (Part 1)* | *Ref [1-5], lecture note* |
| 11 | Alat berangka bagi analisa dan rekabentuk pandu gelombang (Bahagian 2)<br>*Numerical tools for optical waveguide analysis and design (Part 2)* | *Ref [1-5], lecture note* |
| 12 | Aplikasi: Pengesanan indeks biasan<br>*Applications: Refractive index sensing* | *Ref [1-5], lecture note* |
| 13 | Aplikasi: Pengawasan kesihatan struktur<br>*Applications: Structural health monitoring* | *Ref [1-5], lecture note* |
| 14 | Aplikasi: Pengesanan bio<br>*Applications: Biosensing* | *Ref [1-5], lecture note* |