UNIVERSITI MALAYA

**MAKLUMAT KURSUS UNTUK SEMESTER/PENGGAL SEMASA**
***COURSE INFORMATION FOR CURRENT SEMESTER/TERM***

| | |
|---|---|
| Sesi Akademik<br>*Academic Session* | 2020/2021 |
| Semester/Penggal<br>*Semester/Term* | 2 |
| Kod Kursus<br>*Course Code* | KIE 4021 |
| Tajuk Kursus<br>*Course Title* | Rekabentuk Electronik Analog<br>*Analog Electronics design* |
| Bahasa Pengantar<br>*Medium of Instruction* | Bahasa Inggeris<br>*English* |
| Rujukan Utama<br>*Main Reference* | 1. Microelectronics circuit analysis and design. 4th edition, Donald Neamen), 4th Ed., Pearson, 2016.<br>2. Microelectronic circuits, 5th edition, Sedra & Smith, Oxford Press, 2014. |
| Strategi Pembelajaran<br>*Learning Strategies* | Kuliah, Tutorial, Pembelajaran Kendiri<br>*Lectures, Tutorials, Independent learning* |
| Masa Pembelajaran Pelajar<br>*Student Learning Time* | Bersemuka / *Face to face* : 31 jam/*hours*<br>Tidak Bersemuka / *Non Face to face*: 0 jam/*hour*<br>Masa Persediaan Pelajar / *Student Preparation Time*: 49 jam/*hours* |
| Kemahiran Boleh Pindah<br>Transferable Skills | Penyelesaian Masalah, Kemahiran Menganalisa<br>*Problem Solving Skills, Analytical Skills.* |
| Pensyarah / *Lecturer*<br><br>Bilik / *Room*<br><br>Telefon/e-mel<br>*Telephone/e-mail* | Prof Mahmoud Moghavvemi<br><br>No 5 level 1<br><br>03-79676817 / mahmoud@um.edu.my |
| Sesi Kuliah / *Lecture Session:*<br><br>Hari/Masa / *Day/Time*<br><br>Tempat / *Venue* | Rujuk jadual waktu kuliah<br><br>*Refer to the lecture timetable* |
| Sesi Tutorial/Amali:<br>*Tutorial/Practical Session:*<br><br>Hari/Masa / *Day/Time*<br><br>Tempat / *Venue* | Rujuk jadual waktu kuliah<br><br>*Refer to the lecture timetable* |
| Perincian Pemberatan Penilaian<br>*Detail of Assessment Weightage* | Penilaian Berterusan / *Continuous Assessment* : 40%<br><br>Peperiksaan Akhir / *Final Examination* : 60% |

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**Jadual Pengajaran / *Teaching Schedule***

| Minggu<br>*Week* | Topik & Aktiviti<br>*Topic & Activities* | Rujukan<br>*References* |
|---|---|---|
| 1 | Pengenalan kepada penguat litar bersepadu, penguat berperingkat, arus cermin<br>*Introduction to Integrated-Circuit amplifiers, Cascade amplifiers, Current mirrors* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 2 | Sumber arus malar, litar pandu arus (BJT, MOSFET)<br>*Constant-current sources, Current steering Circuits (BJT, MOSFET)* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 3 | Penguat kebezaan dan peringkat gandaan<br>*Differential Amplifiers and gain stages* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 4 | Penganjak-aras dan penimbal<br>*Level shifters and buffers* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 5 | Peringkat keluaran, suap balik dan kestabilan dalam peringkat keluaran penguat<br>*Output stage, Feedback and stability in amplifier output stage* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 6 | Suap balik dan kestabilan dalam penguat<br>*Feedback and stability in amplifiers* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 7 | Teknik-teknik lanjutan dalam rekabentuk litar bersepadu (perspektif industri)<br>*Advanced techniques in design of integrated circuit (industry perspectives)* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 8 | Ujian separuh penggal<br>*Mid-term test* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 9 | Pengenalan kepada pengayun. Prinsip umum pengayunan. Syarat-syarat untuk mengekalkan pengayunan, klasifikasi pengayun, operasi dan ciri-ciri RC, LC, dan pengayun hablur<br>*Introduction to oscillators. General principles of oscillation. Conditions for sustained oscillation, classifications of oscillators, operation and characteristics of RC, LC, and crystal oscillator.* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 10 | Teknik rekabentuk pengayun. Tutorial<br>*Oscillator Design techniques. Tutorial* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 11 | Penjana gelombang (sinus, segi empat sama, segi tiga), Teknik pembatasan amplitud<br>*Waveform generators (sine, square, triangular) waveform, Amplitude limitation technique* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 12 | Gelung terkunci fasa<br>*Phase locked loop* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 13 | Rekabentuk bekalan kuasa dengan menggunakan diod zener dan transistor, pengatur talian dan beban, pengatur siri dan pirau<br>*Power supply design using zener diodes and transistors, line and load regulation, series and shunt regulators* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |
| 14 | Pengatur suap balik dan lipat balik, penggunaan op amp dalam bekalan kuasa berayun, rekabentuk litar bersepadu pengaturan voltan. Tutorial.<br>*Feedback and fold back regulators, use of op amps in regulated power supplies, Voltage regulated IC design. Tutorials* | Ruj [1,2], nota kuliah<br>*Ref [1,2], lecture note* |