

PRO FORMA KURSUS COURSE PRO FORMA

Semester 2 Sesi 2023/2024

1. Maklumat Kursus / Course Info

Nama Kursus: Course Name:	Elektronik Asas / <i>Basic Electronics</i>		
Kod Kursus: Course Code:	SFE3013	Nilai Kredit: Credit Value:	3

2. Sinopsis / Synopsis

Kursus ini merangkumi kedua-dua elektronik analog dan digital. Kandungan kursus termasuk asas teori litar, semikonduktor, diod, pembekal kuasa d.c., transistor simpang dwi-kutub, penguat isyarat kecil dan penguat operasi. Kursus ini juga membincangkan kod binari, kod, get-get logik, kombinasi get-get logik, aljabar Boolean, peta Karnaugh dan flip-flop.

The course covers both analogue and digital electronics. Course content includes basic circuit theory, semiconductors, diodes, d.c. power supplies, bipolar junction transistors, small-signal amplifiers and operational amplifiers. This course also discusses binary codes, logic gates, combining logic gates, Boolean algebra, Karnaugh maps, and flip-flops.

3. Nama Staff Akademik / Name(s) of Academic Staff

1. Encik Wan Zul Adli bin Wan Mokhtar

4. Semester dan Tahun / Semester and Year Offered

Semester: Semester:	2	Tahun: Year:	1
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5. Prasyarat (jika ada) / Prerequisite (if any)

Tiada / None

6. Hasil Pembelajaran Kursus / Course Learning Outcomes (CLO)

CLO1	Menunjukkan pengetahuan mendalam elektronik asas analog dan digital <i>Demonstrate in-depth knowledge in basic analogue and digital electronics</i>	C3
CLO2	Mengukur sifat elektrik peranti semikonduktor <i>Measure the electrical properties of semiconductor devices</i>	P3
CLO3	Menerangkan manfaat elektronik dalam kehidupan seharian <i>Explain the benefits of electronics in everyday life</i>	A3

7. Pemetaan Hasil Pembelajaran Kursus kepada Hasil Pembelajaran Program / Mapping of the Course to the Programme Learning Outcomes

CLO	Program Learning Outcomes (PLO)										Teaching Methods	Assessment
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10		
CLO1	✓										• Kuliah / Lecture	• Peperiksaan Akhir / Final Examination • Kuiz / Quiz
CLO2			✓								• Praktikal / Practical • Kuliah / Lecture	• Laporan Praktikal / Practical Report
CLO3									✓		• Kuliah / Lecture • Pembelajaran Berasaskan Projek / Project Based Learning	• Tugas (Berkumpulan) / Assignment (Group)

(Deskripsi ini mesti dibaca bersama dengan Standard 2.1.2, 2.2.1 dan 2.2.2 di Area 2 - muka surat 16 & 18 / This description must be read together with Standards 2.1.2, 2.2.1 and 2.2.2 in Area 2 - pages 16 & 18)

Hasil Pembelajaran Program / Programme Learning Outcomes

PLO1	Menerangkan pengetahuan teoretikal dan teknikal dalam bidang pendidikan dan fizik (MQF1). <i>Explain the theoretical and technical knowledge in education and physics (MQF1).</i>
PLO2	Menyelesaikan masalah atau isu luar jangka secara kreatif dan inovatif (MQF2). <i>Solving problems or unexpected issues creatively and innovatively (MQF1)</i>
PLO3	Menggunakan pelbagai kaedah dan kemahiran teknikal serta manipulatif untuk menyelesaikan masalah fizik (MQF3). <i>Use various technical and manipulative methods and skills to solve physics problems (MQF3).</i>
PLO4	Berkomunikasi secara bertulis dan lisan melalui pelbagai media penyampaian (MQF4). <i>Communicate in written and oral through various media presentations (MQF4).</i>
PLO5	Bekerja bersama pelbagai komuniti pembelajaran dan pekerjaan (MQF4) <i>Working with various learning and employment communities (MQF4)</i>

PLO6	Menjalankan penyelidikan dalam pendidikan fizik (MQF5). <i>Conduct research in physics education (MQF5)</i>
PLO7	Menggunakan pelbagai maklumat, media dan teknologi untuk menyokong pengajaran dan pembelajaran fizik (MQF5). <i>Utilize variable information, media and technologies to support teaching and learning in physics (MQF5)</i>
PLO8	Bekerja berautonomi dan menunjukkan kepimpinan semasa aktiviti social dan kemasyarakatan (MQF6). <i>Work autonomously by showing leadership during social activities (MQF6)</i>
PLO9	Melibatkan diri dengan pembelajaran terarah sendiri dan sepanjang hayat serta menunjukkan kompetensi keusahawanan dalam projek terpilih (MQF7). <i>Involve in directed self-learning and lifelong learning through competence entrepreneurship in selected projects (MQF7)</i>
PLO10	Berpegang kepada etika dan kod amalan profesional serta menunjukkan pengetahuan yang jelas terhadap isu tempatan dan global (MQF8). <i>Adhere to professional ethics and codes of practice and demonstrate clear knowledge of local and global issues (MQF8)</i>

8. Kemahiran yang boleh dipindahkan (jika berkaitan) / *Transferable Skills (if applicable)*

1	Teori asas peranti elektronik <i>The basic theory of electronic devices</i>
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9. Pengagihan Jam Pembelajaran Pelajar / *Distribution of Student Learning Time (SLT)*

Week	Course Content Outline	CLO			Conventional						Online				SLT
					Guided Learning (F2F)				Guided Learning (NF2F)	Independent Learning (NF2F)	Learning Material		Activities		
		CLO1	CLO2	CLO3	L	T	P	O			Guided	Non Guided	Guided	Non Guided	
1	<u>Elektronik Analog</u> Perintang dan kod warna, Voltan, arus dan beban, Litar sesiri dan selari, Hukum Ohm, Hukum Kirchhoff. <u>Analogue Electronics</u> <i>Resistors and colour code, Voltage, current and load, Series and parallel circuits, Ohm's Law, Kirchhoff's Laws</i>	✓				0	0	0		2	2	2	0	0	6

2	Diod Semikonduktor Pengalir, Penebat dan Semikonduktor, semikonduktor jenis N dan P, pembawa majoriti dan minoriti, simpang PN, Ciri-ciri lengkung diod, penentuan terminal diod, litar setara diod, jenis-jenis diod dan applikasi - LED, zener. Semiconductor Diodes <i>Conductors, Insulators and Semiconductors, N and P - type Semiconductors, Majority and minority Carriers, PN Junction, Characteristic Curves of Diodes, Diode Lead Identification, Diode Equivalent Circuit, Diode Types and application - LED, zener</i>	✓	✓		0	0	2	0	1	6	3	0	0	0	12
4	Pembekal Kuasa DC Sistem Pembekal Kuasa, Penerus: Gelombang-separuh and Gelombang-penuh, Conversion of RMS Values to Average Values, Filters, Voltage Multipliers, Ripple and Regulation, Zener Regulators. DC Power Supply <i>The Power-Supply System, Rectification: Half-Wave and Full-Wave, Conversion of RMS Values to Average Values, Filters, Voltage Multipliers, Ripple and Regulation, Zener Regulators.</i>	✓	✓		2	0	1	0	0	3					6
5	Transistor Simpangan Dwikutub Pembinaan, Operasi, Konfigurasi Asas Umum, Input dan Ciri-ciri Output I-V, Tindakan Penguatan, Konfigurasi Transistor: Tapak Sepunya, Pemancar Sepunya, dan Pemungut Sepunya, Had operasi, Pengujian Transistor. Bipolar Junction Transistors <i>Construction, Operation, Common-Base Configuration, Input and Outputs I-V Characteristics, Amplifying Action, Transistor Configuration: Common-Base, Common-Emitter, and Common-Collector, Limits of operation, Transistor testing.</i>	✓	✓		3	0	2	0	1	10					16

7	Penguat Isyarat Kecil Titik Operasi, Litar Pincang Pemancar-sepunya: Litar Pincang Tetap dan Litar Pincang Pembahagi-Voltan. Penguat operasi Small- Signal Amplifiers <i>Operating Point, Common-Emitter Bias Circuit: Fixed-Bias Circuit, and Voltage-Divider Bias Circuit. Operational amplifier.</i>	✓	✓		2	0	2	0	1	7	2	0	0	0	14
10	Penerima Radio Modulasi dan Demodulasi, Penerima Superheterodyne, Modulasi Frekuensi dan sideband tunggal Radio Receivers <i>Modulation and Demodulation, Superheterodyne Receiver, Frequency Modulation and Single Sideband.</i>	✓		✓	2	0	0	0	1	3					6
11	Nombor dan Sistem Pengkodan Elektronik Digital, Decimal dan Perduaan, Penukaran penomboran, Perduaan kepada Decimal, Decimal kepada Perduaan, Nombor Hexadecimal, Nombor Octal, Kod BCD 8421, Bit, Bytes, Nibbel, dan Saiz Perkataan. Numbers and coding systems <i>Digital Electronics, Decimal and Binary, Binary to Decimal Conversion, Decimal to Binary Conversion, Hexadecimal Numbers, Octal Numbers, 8421 BCD Code, Bits, Bytes, Nibbles, and Word Size</i>	✓			2	0	0	0	1	3					6
12	Get-Get logik & Menggabungkan Get-Get logik Get DAN, ATAU, TAK, TAK-DAN, TAK-ATAU, X-ATAU dan XTAK-ATAU. Get TAK-DAN sebagai Get sejagat, Get dengan lebih daripada dua input, menggunakan Inverters untuk menukar Get, membina litar daripada ungkapan Boolean, melukis litar dari ungkapan Minterm Boolean, Jadual Kebenaran & Algebra Boolean, meringkaskan Boolean. Logic gates & Combining Logic gates <i>The AND, OR, NOT, NAND, NOR, XOR and XNOR gates. The NAND gate as a universal gate, gates with more than two inputs, using Inverters to convert gates, constructing circuits from Boolean expressions, drawing a circuit from a Minterm Boolean expression, Truth Tables & Boolean Algebra, simplifying Boolean.</i>			✓	2	0	0	2	2	6					12

14	Flip-Flop Selak R-S, Flip-Flop: R,-S D, T dan J-K.			✓	2	0	0	0	1	3					6
	Flip-Flops <i>R-S Latch, Flip-Flop: R-S, D, T and J-K</i>														
	TOTAL				15	0	7	2	8	43	7	2	0	0	84
Continuous Assessment					Percentage (%)			Conventional			Online	SLT			
								F2F		NF2F					
1	Kuiz (<i>Quiz</i>)				15			1		4			5		
2	Laporan Praktikal (<i>Practical Report</i>)				20			4		4			8		
3	Tugasan (Berkumpulan) (<i>Assignment (Group)</i>)				25			3		8			11		
TOTAL					60			8		16		0		24	
Final Assessment					Percentage (%)			Conventional			Online	SLT			
								F2F		NF2F					
1	Peperiksaan Akhir (<i>Final Examination</i>)				40			2		10			12		
TOTAL					40			2		10		0		12	
GRAND TOTAL													120		

10. Keperluan Khas / Special Requirement

Komputer dan internet yang stabil.

computer and stable internet coverage

11. Rujukan / Reference

Boylestad, R. & Nashelsky, L. (2013). Electronic Devices and Circuit Theory (11th ed.). New Jersey: Pearson Education.

Malvino, A. P. & Bates, D. J. (2016). Electronic Principles (8th ed.). New York:Mc Graw Hill.

Schuler, C. A. (2018). Electronics: Principles and Applications (9th ed.). Singapore:Mc Graw Hill.

Thomas, L. F. (2015). Digital Fundamentals (11th ed.). London:Pearson.

Tokheim, R. L. (2014). Digital Electronics: Principles and Applications (8th ed.). New York:Mc Graw Hill

12. Maklumat Tambahan Lain / Others Additional Information

Tiada / None

13. Pengesahan / Verification

	Disediakan/ Dikemaskini oleh: Prepared/ Updated by:	Disemak oleh: Checked by:
Nama: Name:	ENCIK WAN ZUL ADLI BIN WAN MOKHTAR	DR. MOHD FAUDZI BIN UMAR
Jawatan: Designation:	Penyelaras Kursus Course Coordinator	KETUA JABATAN
Tarikh: Date:	25 MARCH 2024	25 MARCH 2024

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