

PRO FORMA KURSUS COURSE PRO FORMA

Semester 2 Sesi 2023/2024

1. Maklumat Kursus / Course Info

Nama Kursus: Course Name:	Keelektromagnetan / <i>Electromagnetism</i>		
Kod Kursus: Course Code:	SFT3013	Nilai Kredit: Credit Value:	3

2. Sinopsis / Synopsis

Kursus ini memberi tumpuan kepada prinsip-prinsip asas fizik dan pengetahuan dalam keelektrikan dan kemagnetan. Topik-topik yang dibincangkan adalah cas elektrik, hukum Coulomb, medan elektrik, keupayaan elektrik, kapasitan, hukum Ohm, daya gerak elektrik (DGE), arus terus dan ulang alik, litar sesiri dan selari, hukum Kirchoff, daya magnet, medan magnet dan induktan.

The course focuses on basic principles and knowledge of electricity and magnetism. Topics discussed in this course are electric charges, Coulomb's law, electric field, electric potential, capacitance, Ohm's law, electromotive force (EMF), direct and alternating current, series and parallel circuit, Kirchoff's circuit laws, magnetic force, magnetic fields and inductance.

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

1. Dr. Izan Roshawaty binti Mustapa
2. Dr. Nurul Syafiqah Yap Abdullah

4. Semester dan Tahun / Semester and Year Offered

Semester: Semester:	1	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	Menghubung kait pengetahuan berkenaan keelektrikan, magnet dan keelektromagnetan dalam menyelesaikan situasi saintifik tertentu (C5, PLO2). <i>Integrate knowledge related to electricity, magnetism and electromagnetism in solving specific scientific situations (C5, PLO2).</i>	C5
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CLO2	Melaksanakan tugas praktikal secara berkesan (P3, PLO3). <i>Perform practical task effectively (P3, PLO3).</i>	P3
CLO3	Belajar secara sendiri melalui pelbagai sumber yang boleh dipercayai (A4, PLO6). <i>Learn independently via various reliable resources (A4, PLO6).</i>	A4
CLO4	Mempamerkan pemikiran dan kemahiran keusahawanan dalam pengurusan tugas (A3, PLO10). <i>Demonstrate entrepreneurial thinking and skills in project management (A3, PLO10).</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	PLO11		
CLO1										✓		- Kuliah / <i>Lecture</i> - Tutorial / <i>Tutorial</i> - Pembelajaran Teradun / <i>Blended Learning</i>	- Peperiksaan Akhir / <i>Final Examination</i> - Kuiz / <i>Quiz</i>
CLO2			✓									Praktikal / <i>Practical</i>	Laporan Praktikal / <i>Practical Report</i>
CLO3						✓						- Projek / <i>Project</i> - Pembelajaran Teradun / <i>Blended Learning</i>	- Tugasan (Berkumpulan) / <i>Assignment (Group)</i> - Ujian / <i>Test</i>
CLO4										✓		- Perbincangan / <i>Discussion</i> - Projek / <i>Project</i>	Persembahan / <i>Presentation</i>

(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>Describe theoretical and technical knowledge in education and physics [MQF1]</i>
PLO2	Mempamerkan keupayaan intelektual melalui aplikasi kemahiran berfikir berkaitan bidang pendidikan dan fizik. [MQF2] <i>Demonstrate intellectual ability through the application of thinking skills related to the field of education and physics . [MQF2]</i>
PLO3	Mengaplikasikan kaedah dan kemahiran praktikal yang sesuai bagi pelaksanaan tugas dalam bidang pendidikan dan fizik. [MQF3A] <i>Apply appropriate methods and practical skills for the implementation of tasks in the field of education and physics . [MQF3A]</i>
PLO4	Berinteraksi secara efektif dengan menggunakan kemahiran interpersonal yang berkesan. [MQF3B] <i>Interact effectively using effective interpersonal skills. [MQF3B]</i>

PL05	Berkomunikasi secara bertulis dan lisan melalui pelbagai media penyampaian. [MQF3C] <i>Communicate in writing and orally through a variety of delivery media. [MQF3C]</i>
PL06	Mengintegrasikan pelbagai sumber media dan teknologi digital bagi menyelesaikan tugas. [MQF3D] <i>Integrate various media sources and digital technologies to complete tasks. [MQF3D]</i>
PL07	Mengaplikasikan kemahiran numerasi dalam penyelesaian masalah. [MQF3E] <i>Apply numeracy skills in problem solving. [MQF3E]</i>
PL08	Menunjukkan kepimpinan, sikap berautonomi dan kebertanggungjawaban pada pelbagai peringkat pengurusan. [MQF3F] <i>Demonstrates leadership, autonomy and accountability at various levels of management. [MQF3F]</i>
PL09	Mempamerkan kemajuan diri menerusi pembelajaran berterusan dan pembangunan profesional secara proaktif. [MQF4A] <i>Demonstrate self-improvement through continuous learning and professional development proactively. [MQF4A]</i>
PL010	Mempamerkan pemikiran dan kemahiran keusahawanan dalam pengurusan projek. [MQF4B] <i>Demonstrate entrepreneurial thinking and skills in project management. [MQF4B]</i>
PL011	Mematuhi kod etika dalam persekitaran sosial dan amalan profesional. [MQF5] <i>Adhere to a code of ethics in social environment and professional practice. [MQF5]</i>

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

1	Kemahiran Menyelesaikan Masalah <i>Problem Solving</i>
2	Kemahiran Berkolaborasi <i>Collaboration Skill</i>
3	Kemahiran Praktikal <i>Practical Skill</i>
4	Kemahiran Kerja Berpasukan <i>Teamwork Skill</i>

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	CLO4	L	T	P	O			Guided	Non Guided	Guided	Non Guided	

1-2	Bab 1: Cas Elektrik - Hukum Coulomb - Medan Elektrik - Garis Elektrik Chapter 1: Electric Charge - Coulomb's Law - Electric Field - Electric Field Lines	✓		✓		0	0	0	0	0	1	4	2	2	4	13
3	Bab 2: Hukum Gauss - Flux Elektrik - Aplikasi Hukum Gauss - Cas pada Konduktor Chapter 2: Gauss's Law - Electric Flux - Application of Gauss's Law - Charge on Conductor	✓		✓		0	0	0	0	0	1	4	2	2	4	13
4	Bab 3: Keupayaan Elektrik - Tenaga Keupayaan Elektrik - Permukaan Sama Upaya Chapter 3: Electric Potential - Electric Potential Energy - Equipotential Surfaces	✓		✓		1	1	0	1	0	3					6
5	Bab 4: Kapasitan dan Dielektrik - Kapasitor dan Kapasitans - Dielektrik - Hukum Gauss dalam Dielektrik Chapter 4: Capacitance and Dielectric - Capacitors and Capacitance - Dielectrics - Gauss's Law in Dielectrics	✓		✓		1	1	0	1	0	3					6

6	Bab 5: Arus, Rintangan dan Daya Elektromotif - Arus - Kerintangan dan Rintangan - Daya Elektromotif dan Litar Chapter 5: Current, Resistance & Electromotive Force - Current - Resistivity and Resistance - Electromotive Force & Circuits	✓	✓	✓		1	1	2	1	0	4					9
7-8	Bab 6: Litar Arus Terus - Hukum Kirchhoff - Litar RC - Sistem Agihan Kuasa Chapter 6: DC Circuit - Kirchhoff's Rules - RC Circuit - Power Distribution System	✓	✓	✓		1	1	1	1	0	4					8
9	Bab 7: Medan Magnet dan Daya Magnet - Kemagnetan - Flux Magnet - Daya Magnet dan Kilas Chapter 7: Magnetic Field and Magnetic Force - Magnetism - Magnetic Flux - Magnetic Force and Torque	✓	✓	✓		1	1	2	1	0	4					9
10	Bab 8: Sumber Medan Magnet - Medan Magnet bagi Cas Bergerak, Elemen Arus, Konduktor Lurus Pembawa Arus dan Lingkaran Arus Bulatan. - Hukum Ampere Chapter 8: Sources of Magnetic Field - Magnetic Field of a Moving Charge, a Current Element, a Straight Current Carrying Conductor and a Circular Current Loop - Ampere's law	✓		✓		1	1	0	1	0	2					5

11-12	Bab 9: Aruhan Elektromagnet - Hukum Faraday & Hukum Lenz - D.G.E. - Medan Elektrik Teraruh - Arus Eddy Chapter 9: Electromagnetic Induction - Faraday's Law & Lenz's Law - Motional E.M.F - Induced Electric Fields - Eddy Current	✓	✓	✓		1	1	1	1	0	4					8
13	Bab 10: Aruhan - Induktans Bersama - Induktans Kendiri - Litar RL, LC and LRC Chapter 10: Induction - Mutual Inductance - Self-inductance - RL, LC and LRC Circuits	✓		✓		1	1	0	1	0	2					5
14	Pembentangan Tugasan Projek Presentation Project Assignment				✓	0	0	0	0	0	0	0	2	0	2	4
TOTAL						8	8	6	8	0	28	8	6	4	10	86
Continuous Assessment									Percentage (%)		Conventional		Online	SLT		
											F2F	NF2F				
1	Kuiz (Quiz)								10		1	1	3	5		
2	Ujian (Test)								15		1	2	0	3		
3	Laporan Praktikal (Practical Report)								15		0	5	0	5		
4	Tugasan (Berkumpulan) (Assignment (Group))								10		0	4	3	7		
5	Persembahan (Presentation)								10		2	4	2	8		
TOTAL									60		4	16	8	28		

Final Assessment		Percentage (%)	Conventional		Online	SLT
			F2F	NF2F		
1	Peperiksaan Akhir (<i>Final Examination</i>)	40	2	4	0	6
TOTAL		40	2	4	0	6
GRAND TOTAL						120

10. Keperluan Khas / *Special Requirement*

Tiada

None

11. Rujukan / *Reference*

Main References

Giancoli, D.C. (2015). Physics: Principle with Application (7th Edition). Harlow, United Kingdom: Pearson Education Limited.

Young, H.D. & Freedman, R.A. (2020). University Physics with Modern Physics (15th Edition). Harlow, United Kingdom: Pearson Education Limited.

Additional References

Edward M. Purcell & David J. Morin. (2019). Electricity and Magnetism. Cambridge, United Kingdom: Cambridge University Press.

Ulaby, F.T. & Ravaioli, U. (2020). Fundamentals of Applied Electromagnetics (8th Edition). United Kingdom: Pearson.

Walecka, J.D. (2018). Introduction to Electricity and Magnetism. Singapore: World Scientific.

12. Maklumat Tambahan Lain / *Others Additional Information*

Senarai Amali:

Hukum Ohm
Hukum Kirchoff
Simulasi PhET untuk Aruhan Elektromagnet

List of practical tasks:

Ohm's Law
Kirchoff's Law
PhET Simulation of Electromagnetic Induction

13. Pengesahan / Verification

	Disediakan/ Dikemaskini oleh: Prepared/ Updated by:	Disemak oleh: Checked by:
Nama: Name:	DR. IZAN ROSHAWATY BINTI MUSTAPA	DR. MOHD FAUDZI BIN UMAR
Jawatan: Designation:	Penyelaras Kursus Course Coordinator	KETUA JABATAN
Tarikh: Date:	22 MARCH 2024	23 MARCH 2024

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