

SEKOLAH KEJURUTERAAN ELEKTRIK	
Nama Matapelajaran: Makmal Tahun 3 (PBL)	Semakan : 3
Kod Matapelajaran : SKEE 3742	Tarikh Keluaran : 2008
	Pindaan Terakhir : 2019
	No. Prosedur : PK-UTM-FKE-(0)-10



SKEE 3742

SEKOLAH KEJURUTERAAN ELEKTRIK

FAKULTI KEJURUTERAAN

UNIVERSITI TEKNOLOGI MALAYSIA

POWER ELECTRONICS LABORATORY STUDENT PACK

DC Motor Speed Control with Chopper Drive

<p>Disediakan oleh:</p> <p>PM. Dr. Nik Rumzi Nik Idris PM. Dr. Naziha Ahmad Azli PM. Dr. Awang Jusoh PM. Dr. Junaidi Abdul Aziz PM. Dr. Shahrin Md. Ayob PM. Ir. Dr. Tan Chee Wei Dr. Mohd. Rodhi Sahid Dr. Norjulia Mohammad Nordin En. Nik Din Muhammad En. Zaki Daud</p> <p>Tarikh : 18 Julai 2019</p>	<p>Disahkan oleh:</p> <p>Pengarah Program Dr. Jasrul Jamani Jamian</p> <p>Tandatangan Cop :</p> <p>Tarikh : 18 Julai 2019</p>
--	--

1.	<p>Project Guide:</p> <p>(a) Keywords / Questions That Can Help You Tackle The Problem</p> <p>The following topics can give you some ideas on how to start the project:</p> <ul style="list-style-type: none"> Power electronic energy conversion DC-DC converter topology Insulated Gate Bipolar transistor (IGBT) Duty cycle D , control Variable DC output DC motor ant its equivalent circuit Motor constant parameters DC motor speed control Quadrant of Operation <p>(b) Problem-solving Time-line</p> <table border="1" data-bbox="228 730 1458 1010"> <thead> <tr> <th data-bbox="240 743 297 814"></th> <th data-bbox="297 743 1081 814">Activities</th> <th data-bbox="1081 743 1203 814">Week 1</th> <th data-bbox="1203 743 1325 814">Week 2</th> <th data-bbox="1325 743 1446 814">Week 3</th> </tr> </thead> <tbody> <tr> <td data-bbox="240 814 297 856">1.</td> <td data-bbox="297 814 1081 856">Understanding/Brainstorming</td> <td data-bbox="1081 814 1203 856">√</td> <td data-bbox="1203 814 1325 856"></td> <td data-bbox="1325 814 1446 856"></td> </tr> <tr> <td data-bbox="240 856 297 953">2.</td> <td data-bbox="297 856 1081 953">Design/Simulation Validation of simulation result with supervisor / sample hardware result</td> <td data-bbox="1081 856 1203 953"></td> <td data-bbox="1203 856 1325 953">√</td> <td data-bbox="1325 856 1446 953"></td> </tr> <tr> <td data-bbox="240 953 297 995">3.</td> <td data-bbox="297 953 1081 995">Presentation with supervisor</td> <td data-bbox="1081 953 1203 995"></td> <td data-bbox="1203 953 1325 995"></td> <td data-bbox="1325 953 1446 995">√</td> </tr> </tbody> </table> <p>(c) Report Writing</p> <ul style="list-style-type: none"> ▪ Follow the formal laboratory/technical report writing, as specified in the general guide of Laboratory Coordinator. <p>(d) Special Write-up</p> <p>Part of the students’ assessment will include reporting of your activities each week in a log book. Students are also required to submit a specific write-up on a particular topic/activities/results each week</p> <p>Each group is expected to submit the following write-ups (maximum 2 pages, font 10, 1.5 spacing)to your facilitator as follows:</p> <ul style="list-style-type: none"> ▪ Write-up on laboratory progress ▪ Write-up on work to done for next week lab <p>Each write-up is to be submitted as teamwork on the second week of the laboratory. Please ensure that each team member is responsible enough to contribute in completing the work.</p>		Activities	Week 1	Week 2	Week 3	1.	Understanding/Brainstorming	√			2.	Design/Simulation Validation of simulation result with supervisor / sample hardware result		√		3.	Presentation with supervisor			√
	Activities	Week 1	Week 2	Week 3																	
1.	Understanding/Brainstorming	√																			
2.	Design/Simulation Validation of simulation result with supervisor / sample hardware result		√																		
3.	Presentation with supervisor			√																	
2.	<p>Equipments list:</p> <ul style="list-style-type: none"> (a) Digital oscilloscope Tektronik / Lecroy (manual is available at the laboratory) (b) 20 V permanent magnet DC motor (c) Differential probe (d) Voltage probe (e) Current Probe (f) Multimeters (V and I) 																				
3.	<p>Components list:</p> <ul style="list-style-type: none"> (a) Leybold Experimental Kit <ul style="list-style-type: none"> i) IBGT 1000V/10A (735 346K) ii) PWM Control Unit (735 341) 																				

	<ul style="list-style-type: none"> iii) Reference variable generator (73402) iv) Capacitor 2x1000μF (735 095K) v) Isolation Amplifier 4-Channel (735261) vi) DC power supply (± 15V, 0 V) (725843K) or GwInstek DC Power Supply vii) RMS meter (727 10) viii) Main/Supply Unit 415 (725 60K)
4.	Softwares:
	<ul style="list-style-type: none"> (a) Matlab/Simulink Student Version Release 14 (available in all PCs at the laboratory) (b) PSpice Student Version 9.1 (available in all PCs at the laboratory)
5.	Additional resources:
	<ul style="list-style-type: none"> (a) Materials related to the problem/project. Can be technical papers, short manual on how to use Matlab/Simulink etc.
6.	References:
	<p>Typically books and/or journal/conference papers</p> <ul style="list-style-type: none"> (a) Introduction to Power Electronics, Daniel W. Hart, Prentice Hall International Inc., 1997 (b) Power Electronics: Converters, Application and designs, Second Edition, Mohan, Underland and Robin, John Wiley and Sons, 1995. (c) Power Electronics: Circuits, Device and Application, Muhammad H. Rashid, Prentice Hall, 2003 (d) Principles of Electric Machines and Power Electronics. P.C. Sen, John Wiley & Sons, 1989