

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



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SKEE 3742
SEKOLAH KEJURUTERAAN ELEKTRIK
FAKULTI KEJURUTERAAN
UNIVERSITI TEKNOLOGI MALAYSIA

POWER ELECTRONICS LABORATORY
STUDENT PACK

Thyristor Control DC 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. Mohd 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>
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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 Silicon Control Rectifier (SCR) Single Phase Rectifier (AC-DC) Firing angle (α) Variable DC output DC motor DC motor speed control <p>(b) Problem-solving Time-line</p> <table border="1" data-bbox="228 705 1456 982"> <thead> <tr> <th data-bbox="240 716 298 783"></th> <th data-bbox="298 716 1081 783">Activities</th> <th data-bbox="1081 716 1203 783">Week 1</th> <th data-bbox="1203 716 1325 783">Week 2</th> <th data-bbox="1325 716 1456 783">Week 3</th> </tr> </thead> <tbody> <tr> <td data-bbox="240 783 298 831">1.</td> <td data-bbox="298 783 1081 831">Understanding/Brainstorming</td> <td data-bbox="1081 783 1203 831">√</td> <td data-bbox="1203 783 1325 831"></td> <td data-bbox="1325 783 1456 831"></td> </tr> <tr> <td data-bbox="240 831 298 930">2.</td> <td data-bbox="298 831 1081 930">Design/Simulation Validation of simulation result with supervisor / sample hardware result</td> <td data-bbox="1081 831 1203 930"></td> <td data-bbox="1203 831 1325 930">√</td> <td data-bbox="1325 831 1456 930"></td> </tr> <tr> <td data-bbox="240 930 298 978">3.</td> <td data-bbox="298 930 1081 978">Presentation with supervisor</td> <td data-bbox="1081 930 1203 978"></td> <td data-bbox="1203 930 1325 978"></td> <td data-bbox="1325 930 1456 978">√</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 Lab. 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			√
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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 (manual is available at the laboratory) (b) 20 V permanent magnet DC motor (c) Differential probe (d) Voltage probe (e) Current Probe (f) Multimeters 																				
3.	<p>Components list:</p> <ul style="list-style-type: none"> (a) Leybold Experimental Kit <ul style="list-style-type: none"> i) Thyristor branch pair (73507) ii) Control Unit 2-pulse (73512) iii) Reference variable generator (73402) 																				

- iv) Transformer 45 / 90 V 3N(725 73K)
- v) Main Supply Unit 415 (725 60K)
- vi) Isolation Amplifier 4-Channel (735261)
- vii) Load Power Electronic (3 x 100 Ω , 2 x 50 mH) (73509)
- viii) DC power supply ($\pm 15V$, 0 V) (725843K)
- ix) RMS meter (727 10)

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
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