

SEKOLAH KEJURUTERAAN ELEKTRIK	
Nama Matapelajaran: Makmal Tahun 3 (PBL)	Semakan : 3
Kod Matapelajaran : SKEE 3742	Tarikh Keluaran : 2008
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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>DR. JASRUL JAMANI BIN JAMIAN Senior Lecturer Electrical Power Eng. Dept. (POWER) Faculty of Electrical Engineering Universiti Teknologi Malaysia 81310 UTM Johor Bahru Johor Darul Takzim</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="304 934 1868 1199"> <thead> <tr> <th>Activities</th> <th>Week 1</th> <th>Week 2</th> <th>Week 3</th> </tr> </thead> <tbody> <tr> <td>1. Understanding/Brainstorming</td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>2. Design/Simulation</td> <td></td> <td>√</td> <td></td> </tr> <tr> <td>3. Experiment and measurement</td> <td></td> <td></td> <td>√</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		√		3. Experiment and measurement			√
Activities	Week 1	Week 2	Week 3														
1. Understanding/Brainstorming	√																
2. Design/Simulation		√															
3. Experiment and measurement			√														
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> <p>(a) Leybold Experimental Kit</p> <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) 																

	<ul style="list-style-type: none"> vi) Isolation Amplifier 4-Channel (735261) vii) Load Power Electronic ($3 \times 100 \Omega$, $2 \times 50 \text{ mH}$) (73509) viii) DC power supply ($\pm 15\text{V}$, 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