

<b>SEKOLAH KEJURUTERAAN ELEKTRIK</b>	
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## **SKEE 3742**

**SEKOLAH KEJURUTERAAN ELEKTRIK  
FAKULTI KEJURUTERAAN  
UNIVERSITI TEKNOLOGI MALAYSIA**

**POWER ELECTRONICS LABORATORY  
STUDENT PACK**

**Thyristor Control DC Drive**

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## Project Introduction:

Power electronic converters are used to convert and control electrical energy. They consist of power semiconductor devices operated as *switches* and passive elements such as inductors and/or capacitors. Ideally, there will be no losses in power electronic converters since there are no losses in ideal switches, inductors or capacitors. There are few types of power electronic converters and their applications in DC drive systems. Generally the selection of the converter depending on the type of applications, such as power rating, transient requirement, mode of operation etc.

## Project tasks:

In this laboratory assignment, students are required to carry out a brief literature review, design and construct the energy conversion circuit (power modulator) so that a variable DC output voltage can be generated. The designed power modulator must be able to drive a DC motor with variable speed. To do the job, the **thyristors (SCR)** can be used to construct the power modulator. A technical report supported with the set of the data and experimental results is expected to be produced at the end of project time. The collected data, data analysis and plots of waveforms should be well presented in the report.

Few questions need to be answered to smooth the project flow:

- Why do we need to convert electrical energy?
- What are the available circuit topologies to drive DC motor?
- What is the DC drive?
- What are the methods to control the speed of a DC motor?
- What is the relationship between firing angle and generated output voltage?
- How the variable speed controls are carried out?
- What is the mode of operation of the DC motor?