

<b>Module code</b>	TE-3304		
<b>Module Title</b>	Electromechanical Energy Conversion and Control		
<b>Degree/Diploma</b>	Bachelor of Engineering Degree		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student workload</b>	8 hours/week
		<b>Contact hours</b>	4 hours/week
<b>Prerequisite</b>	None		
<b>Anti-requisite</b>	None		
<b>Aims</b>			
To provide students a good knowledge on power systems, power flow, AC (Alternating Current) machines, including single phase, split-phase, three-phase (induction and synchronous machines), and DC (direct current) machines. Study on speed control of machines.			
<b>Learning Outcomes:</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	30%	- understand the basic principles of power systems and electromechanical energy conversion	
Middle order:	40%	- analyse the performance of power end energy - analyse the performance of synchronous and induction machines	
Higher order:	30%	- perform experiments for power systems - use laboratory equipment to obtain data from power systems - present information and arguments for justification in written communications	
<b>Module Contents</b>			
<ul style="list-style-type: none"> <li>- Introduction to power systems, power flow, per unit analysis and electromechanical Energy Conversion</li> <li>- Transformer types and construction, ideal transformer, equivalent circuits, power &amp; variable frequency transformers, Transformer analysis on a per unit basis, Voltage regulation &amp; efficiency, Auto-transformers</li> <li>- Electromechanical Energy Conversion, Forces &amp; Torques in Magnetic Field Systems, Energy Balance, Determination of Magnetic Force (torque)</li> <li>- AC Machinery Fundamentals, Rotating magnetic field, Induced voltage &amp; torque in AC machine</li> <li>- Synchronous Generator Construction, Speed &amp; internal generated voltage, Equivalent circuit, Phasor diagram</li> <li>- Basic principles of synchronous motors and their operation, speed control</li> <li>- Construction of induction Motors, Basic concepts, Equivalent circuit, Power &amp; Torque, Torque-speed characteristics</li> <li>- Introduction to DC Machines and their Principle of Operation, commutation</li> <li>- Different types of DC Machines</li> </ul>			
<b>Assessment</b>	Formative assessment	Online multiple choice questions will be used to test and give feedback on their learning	
	Summative assessment	Examination: 50% Coursework: 50% <ul style="list-style-type: none"> <li>- 2 assignments (10% each)</li> <li>- 1 class test (10%)</li> <li>- 2 laboratory reports (10% each)</li> </ul>	