

Module code	TG-2304		
Module Title	Thermodynamics and Energy Conversion		
Degree/Diploma	Bachelor of Engineering Degree		
Type of Module	Major Option		
Modular Credits	2	Total student workload	4 hours/week
		Contact hours	2 hours/week
Prerequisite	None		
Anti-requisite	None		
Aims			
This module will introduce students to the principles of thermodynamics and energy conversion systems.			
Learning Outcomes:			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	30%	<ul style="list-style-type: none"> - understand the basic principles of thermodynamics - describe energy conversion methods both traditional and new involving renewables 	
Middle order :	40%	<ul style="list-style-type: none"> - analyse the performance of thermodynamic systems - collect and analyse data 	
Higher order:	30%	<ul style="list-style-type: none"> - use laboratory equipment to perform experiments - present information in written communications 	
Module Contents			
<ul style="list-style-type: none"> - Basic Topics: States of matter, concepts of heat and work, laws of thermodynamics, temperature and Zeroth law of thermodynamics - Properties of pure substances, phase-change processes, property diagrams, ideal gas equations - 1st law of thermodynamics for closed systems, heat capacity, enthalpy of reactions, Hess's Law, Kirchoff's Equation - 2nd law of thermodynamics, Gibbs and Helmholtz free energy, Clausius-Clapeyron Equation - Entropy, phase transition - Deviations from ideal behaviour: compressibility factor, Van Der Waal Equation - Power cycles - Carnot Cycles - Energy conversion: Fuel and combustion, fuel cells, photovoltaic systems - Phase equilibria (the Phase Rule, Single-Component Systems, Multicomponent systems) and chemical thermodynamics 			
Assessment	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"> - 2 assignments (10% each) - 1 class test (10%), and - 2 Laboratory reports: (10% each) 	