

**ADVANCED DIPLOMA OF PLANT ENGINEERING**

<b>MODULE DETAILS</b>	<p><b>Module 9: Thermodynamics, Compressors, Fans and Blowers.</b></p> <p>Nominal duration: 4 weeks (32 hours total time commitment)</p> <p>This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study.</p>
<b>MODULE PURPOSE</b>	<p>To enable participants to identify the fundamental thermodynamic concepts and to design, select and operate a wide range of compressors, fans and blowers for various applications.</p>
<b>PRE-REQUISITE MODULE(S)</b>	<p>Module 8: Pumps and Seals</p>
<b>ASSESSMENT STRATEGY / CONDITIONS OF ASSESSMENT</b>	<p>To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set. The Training and Assessment Matrix (TAM) documents the assessment criteria included in these assessments, based on the learning outcomes. The Training and Assessment Strategy (TAS) documents the overall training strategy for this Advanced Diploma course. The conditions of assessment are outlined in the Assessment Guidelines, TAM and TAS. Written assignments, group projects and practical exercises are required to meet assessment criteria outlined in the Assessment Guidelines, TAM and TAS.</p>
<b>SUMMARY OF LEARNING OUTCOMES</b>	<ol style="list-style-type: none"> <li>1. Discuss the basic thermodynamic concepts and principles</li> <li>2. Examine and discuss the construction and operation of heat exchangers</li> <li>3. Examine and discuss the construction and operation of reciprocating compressors</li> <li>4. Examine and discuss the construction and operation of centrifugal compressors, fans and blowers</li> </ol>

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<b>Learning Outcome 1</b>	<b>Discuss the basic thermodynamic concepts and principles</b>	
<b>Assessment Criteria</b>	1.1	Explain basic thermodynamic concepts
	1.2	Discuss working substances and thermodynamic processes
	1.3	Describe the state of a system and its transformations
	1.4	Explain the concept of ideal gases
	1.5	Explain equilibrium state
	1.6	Examine and discuss the laws of thermodynamics
<b>Learning Outcome 2</b>	<b>Examine and discuss the construction and operation of heat exchangers</b>	
<b>Assessment Criteria</b>	2.1	Outline the principle of operation of heat exchangers
	2.2	Examine the design of heat exchangers
	2.3	Discuss the construction of heat exchangers
<b>Learning Outcome 3</b>	<b>Examine and discuss the construction and operation of reciprocating compressors</b>	
<b>Assessment Criteria</b>	3.1	Outline the principle of operation of reciprocating compressors
	3.2	Describe the components of reciprocating compressors
	3.3	Examine the performance of reciprocating compressors
	3.4	Discuss compressor applications
<b>Learning Outcome 4</b>	<b>Examine and discuss the construction and operation of centrifugal compressors, fans and blowers</b>	

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<b>Assessment Criteria</b>	4.1	Examine and discuss the construction and principle of operation of centrifugal compressors
	4.2	Examine and discuss the types and operating principles of fans
	4.3	Examine and discuss the types and operating principles of blowers
<b>Delivery mode</b>		
<p>A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, PowerPoint slides, notes, reading and study materials (in PDF, HTML and Word format) accessed through the Moodle Learning Management System (LMS).</p>		