

1. Title	Apply the knowledge of centrifugal water pumps and piping systems		
2. Code	EMPDDE306A		
3. Range	Apply the knowledge of centrifugal water pumps and piping systems and undertake the tasks of designing, installing, commissioning, operating, repairing and maintaining plumbing systems at design offices or sites where such systems are installed.		
4. Level	3		
5. Credits	4		
6. Competency	<u>Performance Requirements</u> 6.1 Knowledge of centrifugal water pumps and piping systems ◆ Understand the working principles and construction of centrifugal pumps, including: • The working principles of centrifugal pumps • The construction of single-stage horizontal centrifugal pumps • The construction of multi-stage centrifugal pumps ◆ Understand the working properties of centrifugal pumps, including: • Definition of flow rate, head, power, efficiency, rotational speed and net positive suction head • Select a suitable centrifugal pump based on the characteristic curve • Locate and modify operating points based on the pump characteristic curve and piping system characteristic curve ◆ Understand the water piping system and the construction, functions and working principles of pipe accessories, including: • Types and uses of valves • The formation of water hammer and its prevention and remedy ◆ Understand the criteria and methods adopted for pipe sizing, including: • The relationship of diameter, flow rate, flow velocity and pressure loss of fitted pipes • Pressure loss of pipe fittings and valves 6.2 Application of the knowledge of centrifugal water pumps and plumbing systems ◆ Apply the knowledge of centrifugal pumps and piping system, including: • Selecting proper centrifugal pumps and pipe fittings according to liquid properties, working conditions, water flow rate and head • Calculating the diameter of pipes, pressure loss, flow velocity and flow rate		

7. Assessment Criteria	The integrated outcome requirement of this unit of competency is: (i) Capable to apply the knowledge of centrifugal water pumps and piping systems to solve the problems involved in designing, installing, commissioning, operating, repairing and maintaining plumbing systems; communicate with the sector and clients.
8. Remarks	This unit of competency is applicable to practitioners who are engaged in designing, installing, commissioning, operating, repairing and maintaining plumbing systems.