1. Title	Design special types of commercial and industrial gas application systems	
2. Code	EMGADE502A	
3. Range	Design special types of commercial and industrial gas application systems for customers in a cost-effective way for commercial and industrial premises to be built or different commercial and industrial application environment according to customers' needs as well as the requirements of the gas safety regulation and codes of practice; take the initiative to accomplish the design task independently and brief the engineering personnel or people concerned on the engineering details; and choose and provide special solutions for non-routine engineering environment.	
4. Level	5	
5. Credits	5	
6. Competency		<u>Performance Requirements</u>
	6.1 Knowledge and principles of designing special types of commercial and industrial gas application systems	♦ Select suitable materials for production of exhaust system flue ♦ Select exhaust fan correctly with appropriate capacity ♦ Calculate the air volume required for gas appliance combustion ♦ Calculate the pressure loss of the exhaust flue correctly ♦ Calculate the differential pressure inside the exhaust flue correctly ♦ Use instruments correctly to measure the wind speed and calibrate accordingly ♦ Use instruments correctly to measure the noise and calibrate accordingly ♦ Draw the working drawing of the exhaust flue
	6.2 Methods and procedures of designing special types of commercial and industrial gas application systems	♦ Use waste heat recovery to enhance the heat efficiency of the commercial and industrial gas appliances ♦ Operate the programmable logic controller to design a control logic used in the commercial and industrial gas application system

			♦ Design a control system for the commercial and industrial gas appliances ♦ Use mechanical theory to design a mechanical operation system suitable for the commercial and industrial gas appliances ♦ Design a pneumatic control system suitable for the commercial and industrial gas appliances ♦ Design safety devices such as flame failure safety device, anti-lightback device, overflow and water-low cut-off device, over and under pressure cut-off device, pressure relief device, etc., to ensure that the gas appliance meets the safety requirements ♦ Select correct burner and accessories for the commercial and industrial gas appliance such as air blower, supercharger, check valve, etc. ♦ Use gas analyser to measure correctly the content of carbon monoxide and carbon dioxide in the exhaust, temperature of the exhaust, etc., analyze the combustion situation and calibrate accordingly for the gas appliance to achieve the best performance ♦ Look up in the friction loss table correctly the exhaust flue dimensions required for the commercial and industrial gas appliances
	6.3	Professional knowledge and responsibilities for designing special types of commercial and industrial gas application systems	♦ Apply all the provisions in the Gas Safety (Installation and Use) Regulations under the Gas Safety Ordinance, Cap. 51 ♦ Apply all the provisions in the Code of Practice GU06 on [LPG Installations for Catering Purposes in Commercial Premises] ♦ Apply all the provisions in the Gas Utilisation Guidance Note GU12 on [Installation of Mechanical Exhaust System for Gas Appliances]

	♦ Apply other gas related regulations and codes of practice ♦ Apply Guidelines of the Environmental Protection Department [Control of Oily Fume and Cooking Odour from Restaurants and Food Business] ♦ Apply the Air Pollution Control Ordinance ♦ Apply the Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations ♦ Apply the provisions in the Building (Ventilating Systems) Regulations under the Buildings Ordinance ♦ Apply the provisions in the Building (Ventilating Systems) Regulations ♦ Apply the Waterworks Ordinance ♦ Apply the Fire Services Ordinance ♦ Apply the Fire Safety (Buildings) Ordinance ♦ Apply the Fire Safety (Commercial Premises) Ordinance
7. Assessment Criteria	The integrated outcome requirement of this unit of competency is: (i) Capable to design special types of innovative commercial and industrial gas application systems for commercial and industrial application environment according to the market or customers' needs.
8. Remarks	The credit value of this unit of competency is set on the presumption that the person already possesses the competency of EMGADE101A【Basic knowledge of gas application】, EMGAIT302A【Install and commission commercial and industrial gas appliances】, EMGADE401A【Design general commercial and industrial flue gas appliances】 and EMGADE402A【Design general commercial and industrial flueless gas appliances】.