1. Title	Design silencing and vibration reduction measures for air-conditioning systems	
2. Code	EMACDE601A	
3. Range	Use highly specialized knowledge and innovative techniques, assess a wide range of information and design silencing and vibration reduction measures for different types of air-conditioning systems at design studios.	
4. Level	6	
5. Credit	12	
6. Competency		Performance Requirements
	6.1 Knowledge of silencing and vibration reduction design for air-conditioning systems	♦ Understand the noise sources of different types of air-conditioning equipment ♦ Understand different types of silencing design ♦ Understand different types of vibration reduction design
	6.2 Methods and procedures of silencing and vibration reduction design for air-conditioning systems	♦ Determine the acceptable standard of indoor noise according to the functions and needs of the space, including: • Determining the acceptable standard of noise for general buildings (including residential premises, shopping malls, hospitals, schools and offices) according to relevant international standards • Determining the acceptable standard of noise for special buildings (such as recording studios and language laboratories) according to relevant international standards ♦ Determine the noise attenuation required by air-conditioning systems, including: • Selecting suitable air-conditioning systems according to noise control requirements • Calculating the sound pressure level of air-conditioning system equipment (including ventilation fans, motors and air-conditioning refrigeration units) • Calculating the overall sound pressure level of air-conditioning equipment • Calculating the natural noise attenuation of air-conditioning systems • Calculating the airflow noise of air-conditioning systems • Calculating the noise attenuation required by air-conditioning systems • Assessing whether the airflow noise from the supply air grilles of air-conditioning systems comply with design requirements

	♦ Design silencers for air-conditioning systems, including: • Selecting the suitable type of silencer and the required quantity according to design requirements and characteristics • Designing suitable silencers according to design requirements of air-conditioning systems • Determining the correct installation position for silencers ♦ Design noise control methods for fan coil unit systems, including: • Using noise assessment curve to analyze the noise range of fan coil units • Determining the installation position for fan coil units for maximized silencing • Selecting fan coil units of low noise emission ♦ Design noise control methods for cooling towers, including: • Calculating the noise range of cooling towers • Measuring and assess the noise emission of cooling towers • Determining the correct installation position for cooling towers so as to reduce the noise impact on the surroundings • Selecting cooling towers of low noise emission • Designing noise barriers to control the noise emission of cooling towers ♦ Design methods to control noise emission from air-conditioning system rooms, including: • Selecting the correct location for air-conditioning system rooms so as to reduce the noise impact on the surroundings • Designing noise barriers for the building enclosure of in air-conditioning system rooms • Designing noise absorption materials and structure to reduce noise emission from air-conditioning system rooms • Designing noise enclosures to reduce noise emission from air-conditioning system rooms ♦ Design vibration reduction methods by the mounting foundation design of air-conditioning equipment, including: • Determining the requirements for vibration reduction of air-conditioning equipment • Selecting suitable mounting foundation • Selecting suitable devices for vibration reduction • Formulating procedures for installation of vibration reduction devices

		♦ Design vibration reduction methods for the pipings of air-conditioning equipment, including: • Selecting suitable flexible tubes for air-conditioning equipment so that the duct vibration can comply with operation requirements • Designing air-conditioning ducts with vibration reduction structure and relevant installation methods so that the duct vibration can comply with operation requirements
	6.3 Professionalism in handling silencing and vibration reduction design for air-conditioning systems	♦ Understand legal requirements and codes of practice, analyze and assess a wide range of information and use highly specialized knowledge and techniques to design innovative silencing and vibration reduction measures for air-conditioning systems
7. Assessment Criteria	The integrated outcome requirement of this unit of competency is: (i) Capable to design innovative silencing and vibration reduction measures for air-conditioning systems systematically and efficiently.	
8. Remarks	The credit value of this unit of competency is set on the presumption that the person already possesses general knowledge of air-conditioning systems, silencing and vibration reduction.	