

-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	4290061	-Session-1991-92
-Superclass-	TH	

-Title-	MECHANICAL SERVICES TECHNOLOGY: VENTILATION AND AIR CONDITIONING (x 1/2)
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-DESCRIPTION-

Purpose	This module is designed to enable the student to understand the functions of ventilation and air conditioning systems, with a view to carrying out basic maintenance checks.
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It is aimed at those having responsibility for carrying out basic maintenance and re-ordering of components for ventilation and air-conditioning systems.

Preferred Entry Level	No formal entry requirements.
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Outcomes	<p>The student should:</p> <ol style="list-style-type: none">1. outline the reasons for ventilation and air conditioning;2. outline the different methods of air filtration in ventilation and air conditioning;3. outline the different types of ventilation systems;4. outline the different types of fans commonly found in ventilation and air-conditioning systems.
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Assessment Procedures	Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.
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The following abbreviations are used below:

PC	Performance Criteria
IA	Instrument of Assessment

Note: The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

OUTCOME 1**OUTLINE THE REASONS FOR VENTILATION AND AIR CONDITIONING****PCs**

- (a) The outline is correct in terms of the explanation of:
 - (i) temperature control;
 - (ii) fresh air supply;
 - (iii) extraction or dispersal of odours;
 - (iv) hygiene
- (b) The outline is correct in terms of the safety, health and hygiene requirements of the relevant regulations and bye-laws.
- (c) The outline is correct in terms of the essential differences between ventilation and air-conditioning.

IA Restricted Response

The student will be presented with a restricted response exercise to test the knowledge required to outline the reasons for ventilation and air conditioning.

The student will be required to give four reasons for the installation and use of ventilation and air conditioning systems, indicating which system would be applicable in each case.

The student will also be required to refer to the relevant regulations and bye-laws governing ventilation and air-conditioning, in connection with safety, health and hygiene.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met.

OUTCOME 2 OUTLINE THE DIFFERENT METHODS OF AIR FILTRATION IN VENTILATION AND AIR CONDITIONING

- PCs
- (a) The outline is correct in terms of the description of the contaminants which cause air pollution.
 - (b) The outline is correct in terms of the explanation of the types of filters used to produce clean air.
 - (c) The outline is correct in terms of the different functions of ventilation and air-conditioning.

IA Short Answers

The student will be presented with an exercise consisting of short answer questions to test the knowledge required to outline the different methods of air filtration in ventilation and air conditioning.

The exercise will consist of one question on contaminants and one on filters. The student will be required to give four examples of contaminants and to name and describe five different types of filters, from the examples listed as follows:

List A (Contaminants)

- (1) dust
- (2) fumes
- (3) mists and fogs
- (4) vapours and gases
- (5) organic particles

List B (Filters)

- (1) dry filters
- (2) absolute filters
- (3) viscous filters
- (4) cell type filters
- (5) automatic filters
- (6) electrostatic filters
- (7) activated carbon filters

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met.

OUTCOME 3 OUTLINE THE DIFFERENT TYPES OF VENTILATION SYSTEMS

- PCs
- (a) The outline is correct in terms of the names of the different types of ventilation systems.
 - (b) The outline is correct in terms of the explanation of the differences between the types of ventilation systems.

IA Completion

Exercise

The student will be presented with a completion exercise to test the knowledge required to outline the different types of ventilation systems.

The exercise will consist of four given incomplete statements which the student will be required to complete, on the following:

- (i) natural ventilation;
- (ii) natural inlet and mechanical extraction;
- (iii) mechanical inlet and natural extraction;
- (iv) mechanical inlet and mechanical extraction.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met.

OUTCOME 4

OUTLINE THE DIFFERENT TYPES OF FANS COMMONLY FOUND IN VENTILATION AND AIR-CONDITIONING SYSTEMS

PCs

- (a) The outline is correct in terms of identification of the following types of fans:
 - (i) propeller;
 - (ii) centrifugal;
 - (iii) axial.
- (b) The description or sketch is correct in terms of the salient features of the different types of fans.

IA Matching Exercise

The student will be set a matching exercise to test the knowledge required to describe the different types of fans commonly found in ventilation and air conditioning systems.

The student will be required to:

either name and give a brief description of or make a labelled sketch of the following:

- (i) a propeller fan;
- (ii) a centrifugal fan;
- (iii) an axial fan.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met.

**The following sections of the descriptor are offered as guidance.
They are not mandatory.**

CONTENT/CONTEXT

Corresponding to Outcomes 1-4:

1. The advantages and disadvantages in conjunction with either system.
Health and Safety regulations.
 2. Dry filters, viscous filters, cell filters, automatic roller filters, electrostatic filters, activated carbon filters, re-usable and disposable filters, in both systems. Health and safety regulations.
 3. Types of systems.

Natural, mechanical inlet, mechanical exhaust, mechanical inlet and exhaust.
 4. Types of fans.
Propeller, centrifugal, axial.
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SUGGESTED LEARNING AND TEACHING APPROACHES

The student should be encouraged to develop practical and physical skills through practical work under supervision.

Wherever practical, actual examples in situ should be used, instead of pictures or diagrams, and demonstrations with working models and hands-on experience for the students should be incorporated where possible.

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