

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION

GENERAL INFORMATION

-Module Number- 8150166 **-Session-**1996-97
-Superclass- VF
-Title- CRAFT AND DESIGN

-DESCRIPTION-

GENERAL COMPETENCE FOR UNIT: Applying a design process and creating artifacts for manufacture.

OUTCOMES

1. explain the factors which influence design;
2. select materials and manufacturing processes to meet design specifications;
3. apply the design process to solve design tasks;
4. produce a fully crafted model or prototype of a solution to a design task;
5. carry out a consumer evaluation of a commercial product.

CREDIT VALUE: 2 NC Credits

ACCESS STATEMENT: Access to this unit is at the discretion of the centre. However it would be beneficial for the candidate to have completed the National Certificate module 8150176 Design and Graphics in Industry.

For further information contact: Committee and Administration Unit, SQA, Hanover House, 24 Douglas Street, Glasgow G2 7NQ.

Additional copies of this unit may be purchased from SQA (Sales and Despatch section). At the time of publication, the cost is £1.50 (minimum order £5.00).

NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION

STATEMENT OF STANDARDS

UNIT NUMBER: 8150166

UNIT TITLE: CRAFT AND DESIGN

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME

1. EXPLAIN THE FACTORS WHICH INFLUENCE DESIGN

PERFORMANCE CRITERIA

- (a) The significance of aesthetics and ergonomics is correctly explained.
- (b) The influences of fashion, consumer demand, and social and environmental considerations are correctly explained.
- (c) Safety, commercial enterprise, economics, technological opportunity and planned obsolescence are correctly explained.

RANGE STATEMENT

The range for this outcome is fully expressed within the performance criteria.

EVIDENCE REQUIREMENTS

Written or oral evidence of the candidate's ability to provide the explanations required for each performance criterion.

OUTCOME

2. SELECT MATERIALS AND MANUFACTURING PROCESSES TO MEET DESIGN SPECIFICATIONS

PERFORMANCE CRITERIA

- (a) The properties of materials are described correctly in terms of their implications for design.

- (b) The materials selected for design solutions are justified in terms of their ability to meet the design specification.
- (c) The methods of forming, shaping, joining and finishing of materials are described correctly in terms of their implication for design.
- (d) The manufacturing processes selected for design solutions are justified in terms of their ability to meet the design specification.

RANGE STATEMENT

Materials: timbers; manufactured boards; ferrous metals; non ferrous metals; thermosets; thermoplastics.

Manufacturing processes: hand/bench; machining; CNC machining; die-casting; injection moulding; extrusion; laminating; pressing.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can select materials and manufacturing processes as defined in performance criteria (b) and (d). Written evidence that the candidate can describe properties of materials and manufacturing processes as defined in performance criteria (a) and (c) all relevant classes in the range statement.

OUTCOME

3. APPLY THE DESIGN PROCESS TO SOLVE DESIGN TASKS

PERFORMANCE CRITERIA

- (a) Stages of the design process applied are appropriate to resolving the set design tasks.
- (b) The investigation is thorough and appropriate to the task.
- (c) The progression of ideas is clearly explained by annotated graphics.
- (d) The factors which might influence the solution are fully explained and the justification for the outcome of the consideration of each factor is valid.
- (e) The use of modelling is explained and is appropriate in terms of its purpose in the design process.
- (f) The graphics for the production, illustration and presentation of the proposed solution are effective for their purpose.
- (g) The evaluation of the proposed solution is valid in terms of the solution's ability to meet the design specification.

RANGE STATEMENT

Design tasks: new designs; modify existing designs; designs involving moving parts.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can apply the stages of the design process as detailed in performance criteria (a) to (g).

Performance evidence that appropriate stages of the design process have been applied to all classes in the range statement.

OUTCOME

4. PRODUCE A FULLY CRAFTED MODEL OR PROTOTYPE OF A SOLUTION TO A DESIGN TASK

PERFORMANCE CRITERIA

- (a) The model or prototype is constructed in accordance with the instructions in the candidate's solution to the design brief.
- (b) The standard of work in terms of craftsmanship, accuracy of shaping, construction, surface preparation and finish is commensurate with the stated function of the model or prototype.
- (c) Tools and equipment selected are appropriate for the purpose and used in a competent and confident manner.
- (d) Working practice complies with current safety standards and regulations pertaining to schools and colleges.

RANGE STATEMENT

The range for this outcome is fully expressed within the performance criteria.

EVIDENCE REQUIREMENTS

Production of completed model or prototype as defined in performance criteria (a) to (d).

OUTCOME

5. CARRY OUT A CONSUMER EVALUATION OF A COMMERCIAL PRODUCT

PERFORMANCE CRITERIA

- (a) The range of criteria considered is appropriate to the object being evaluated.
- (b) The investigation of the criteria is logical, thorough and objective.
- (c) The evaluation is reported clearly and provides valid evidence for any verdict reached.

RANGE STATEMENT

Criteria: fitness for purpose; choice of materials; finish; durability; ease of maintenance; value for money; ergonomics and anthropometrics; aesthetics; environment impact; efficiency; running costs.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can produce an evaluation report as defined in performance criteria (a) to (c) across all relevant classes in the range statement.

ASSESSMENT

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the SQA assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of the assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

SPECIAL NEEDS

In certain cases, modified outcomes and range statements can be proposed for certification. See references at end of support notes.

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NATIONAL CERTIFICATE MODULE: UNIT SPECIFICATION**SUPPORT NOTES**

UNIT NUMBER: 8150166

UNIT TITLE: CRAFT AND DESIGN

SUPPORT NOTES: This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

NOTIONAL DESIGN LENGTH: SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 80 hours. The use of notional design length for programme design and timetabling is advisory only.

PURPOSE This module taken in conjunction with the module 'Design and Graphics in Industry', will provide the student with an insight into, and experience of, the process of bringing design proposals to realisation. Such knowledge and skills are applicable to a wide range of studies and occupations.

SQA publishes summaries of NC units for easy reference, publicity purposes, centre handbooks, etc. The summary statement for this unit is as follows:

This module will allow you to apply a design process and create artefacts for manufacture. You will apply the design process to solve a number of varied tasks one of which you will take to completion in the form of a fully crafted artefact. You will also learn techniques which will allow you to make a thorough and constructive evaluation of consumer products.

CONTENT/CONTEXT Throughout this module safety must be stressed. Safe working practices, care and correct use of equipment should be an integral part of all unit activities.

The unit should allow the candidate experience of the factors which designing for the market place imposes. Background knowledge can be provided through the reading of case studies which illustrate the industrial techniques employed to resolve such factors, describe the implications for design of developments in materials and processes and illustrate the assistance given by technology in such as CAD and CAM.

Corresponding to outcomes 1-5:

1. Much of this can be taught through reading case-studies detailing the design development of a variety of products which have reached the market place.

2. Emphasis should be placed upon the scope and potential of the many materials and processes available to the designer rather than on more detailed working knowledge of each material or process. The case-studies should be a source of much of this material. A resource base should be established to which candidates have ready access.
3. Candidates should be presented with a series of design tasks which will extend their experience of total design and consolidate particular aspects and/or develop particular capabilities. One or more should be capable of being taken to full realisation by the candidate to allow for full evaluation and to satisfy Outcome 4.
4. The model or prototype should be the proposed solution to one of the tasks set in Outcome 3. The only restrictions set should be of time (max. 30 hours), candidate's experience and ability, and availability of appropriate workshops.
5. The object to be evaluated should be readily available and in common use to allow research to be carried on outwith the centre.

APPROACHES TO GENERATING EVIDENCE A candidate-centred, resource-based learning approach is recommended. Source material can be derived from videos, case studies, magazines, books, examples of products, personal experience, home, industrial visits, local environment.

A portfolio should be compiled of examples of the candidate's work, mainly composed of the tasks from Outcome 3, which illustrate the candidate's competence in each of the performance criteria in Outcomes 1, 2, 3 and 4. The artefact created for Outcome 3 should be retained in the centre until all assessment is completed.

ASSESSMENT PROCEDURES Centres may use the Instruments of Assessment that are considered to be most appropriate. Examples of Instruments of assessment which could be used to generate and gather evidence of achievement are as follows:

Outcome 1

Restricted response questions.

Outcome 2

Design folios; restricted response questions.

Outcome 3

Design folios.

Outcome 4

Completed model or prototype.

Outcome 5.

Evaluation report.

PROGRESSION This unit forms part of the GSVQ in Engineering at Level III. Candidates successfully completing the GSVQ in Engineering at Level III will be able to progress to an HNC/D programme in related disciplines.

RECOGNITION Many SQA NC units are recognised for entry/recruitment purposes. For up-to-date information see the SQA guide 'Recognised and recommended Groupings'.

REFERENCES

1. Guide to unit writing. (A018).
2. For a fuller discussion on assessment issues, please refer to SQA's Guide to Assessment. (B005).
3. Procedures for special needs statements are set out in SQA's guide 'Candidates with Special Needs'. (B006).
4. Information for centres on SQA's operating procedures is contained in SQA's Guide to Procedures. (F009).
5. For details of other SQA publications, please consult SQA's publications list. (X037).

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