-SQA- SCOTTISH QUALIFICATIONS AUTHORITY
Hanover House
24 Douglas Street
GLASGOW G2 7NQ

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	**2140020**	**-Session-1990-91**
-Superclass-	**WH**	

-Title-	**CLOTHING MACHINING: MANUFACTURING TECHNOLOGY 2**

-DESCRIPTION-

Purpose

This module is designed to provide the student with the knowledge and skills required to develop a systematic analytical approach for dealing with problems relating to manufacturing processes of needles, threads, fabrics and garment construction used in the clothing and allied industries.

It is intended that this module is taught in conjunction with other related modules and forms part of a course of study which should include complementary industrial experience.

It is aimed at those following a career in clothing machine engineering.

Preferred
Entry Level

Module Number 2140010 Clothing Machining: Manufacturing Technology 1 (x 1/2).

Outcomes

The student should:

1. outline the specialised features and characteristics of industrial sewing machine needles;

2. outline the specialised production processes and techniques used in the manufacture of a range of thread types;

3. outline the structure, classification and properties of a range of fabric types;

4. operate a variety of basic industrial sewing machines for the construction of the main British Standard seam types used in garment manufacture;

5.   outline the basic production and work flow systems used to manufacture a range of garments.

Assessment Procedures

Acceptable performance in this module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

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 SPECIALISED FEATURES AND CHARACTERISTICS OF INDUSTRIAL SEWING MACHINE NEEDLES

PCs

(a)   The identification of specialised needle features is correct.
(b)   The explanation of correct needle selection for a particular sewing operation is correct in terms of its importance.
(c)   The selection of point type for a range of fabric types is correct.

IA   Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the specialised features and characteristics of industrial sewing machine needles.

The exercise will consist of oral/written short answer questions in accordance with the PC as follows:

(a)   identification of 3 specialised features;
(b)   explanation of correct needle selection;
(c)   selection of point type for 3 fabrics.

Satisfactory achievement of the Outcome will be based on all PC being met. This will be demonstrated by the student producing correct responses to each of (a), (b) and (c).

OUTCOME 2   **OUTLINE THE SPECIALISED PRODUCTION PROCESSES AND TECHNIQUES USED IN THE MANUFACTURE OF A RANGE OF THREAD TYPES**

PCs

(a) The description of the basic processes of thread manufacture is correct.

(b) The illustration of thread twist direction and balance test is correct.

(c) The outline of thread count system is correct for:

    (i) fixed weight;
    (ii) fixed length;
    (iii) numbering systems.

(d) The illustration of a range of thread make-ups is correct.

IA   Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the specialised production processes and techniques used in the manufacture of a range of thread types.

The exercise will consist of oral/written short answer questions in accordance with the PC as follows:

(a) 5 processes of thread manufacture;

(b) diagrammatic illustration of:

    (i) thread twist direction;
    (ii) balance test.

(c) explanation of thread count systems:

    (i) fixed weight;
    (ii) fixed length;
    (iii) numbering systems.

(d) 3 sketches of thread make-ups.

Satisfactory achievement of the Outcome will be based on all PC being met. This will be demonstrated by the student producing correct responses to each of (a), (b), (c) and (d).

OUTCOME 3   **OUTLINE THE STRUCTURE, CLASSIFICATION AND PROPERTIES OF A RANGE OF FABRIC TYPE**

PCs

(a) The illustration of the basic weave construction is correct in terms of structure.

(b)   The description of the characteristics of woven fabric, knitted fabric and bonded fabric is correct in terms of their differences and properties.

(c)   The identification of finishing processes is correct in terms of application to fabrics.

IA   Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the structure, classification and properties of a range of fabric types.

The exercise will consist of oral/written short answer questions in accordance with the PC as follows:

(a)   sketch of the basic weave construction
(b)   difference between the characteristics of:

(i)   woven fabric;
(ii)   knitted fabric;
(iii)   bonded fabric.

(c)   identification of 10 finishing processes.

Satisfactory achievement of the Outcome will be based on all PC being met. This will be demonstrated by the student producing correct responses to each of (a), (b) and (c).

OUTCOME 4   **OPERATE A VARIETY OF BASIC INDUSTRIAL SEWING MACHINES FOR THE CONSTRUCTION OF THE MAIN BRITISH STANDARD SEAM TYPES USED IN GARMENT MANUFACTURE**

PCs   (a)   The selected stitch density, thread type, needle size and machine are correct for the given seam type.

(b)   The procedures adopted for the preparation of the machine are correct.

(c)   The operation of the machine including the use of reverse mechanism and underbed trimmers is in accordance with accepted procedures.

(d)   The operation of the machine's special features and use of attachments is in accordance with accepted procedures.

(e)   The identification of British Standard seam types and the factors relating to seam evaluation is correct.

(f)   The outline of diagnostic and rectification procedures is correct for problems relating to seam defects and failure.

IA   Assignment

The student will be set an assignment consisting of practical exercises and short answer oral/written questions to test the application of knowledge and skills required to operate a variety of basic industrial sewing machines in the construction of the main British Standard seam types used in garment manufacture.

For the practical exercise, the student will be required to produce seams for given types which will include:

(i)   selection of appropriate machinery, threads and needles;
(ii)   methods and sequence of assembly;
(iii)   joining cut parts;
(iv)   stitching of long and short seams;
(v)   use of simple guides, folders, hemmers and templates.

For the short answer questions the student will be required to:

(i)   identify British Standard seam types;
(ii)   identify the factors relating to seam evaluation;
(iii)   describe diagnostic and rectification procedures relating to seam defects and failure.

Satisfactory achievement of the Outcome will be based on the student meeting all of the PC.

OUTCOME 5   **OUTLINE THE BASIC PRODUCTION AND WORK FLOW SYSTEMS USED TO MANUFACTURE A RANGE OF GARMENTS**

PCs   (a)   The outline of the production planning and control processes is correct for the sewing section.
             (b)   The outline of a range of work flow methods is correct.

IA   Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the basic production and work flow systems used to manufacture a range of garments.

The exercise will consist of oral/written short answer questions based on the PC as follows:

(a)   production planning and control processes;
(b)   description of 3 methods of work flow.

Satisfactory achievement of the Outcome will be based on all PC being met. This will be demonstrated by the student producing correct responses to each of (a) and (b).

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

CONTENT/CONTEXT

Safety and safe working practices should form an integral part of the module activities during investigation of practical machine operation and the effects produced in relation to the actual sewing performance of the selected machine types.

Corresponding to Outcomes 1-5:

1.   Recognition of the specialised features and characteristics relating to the uses of industrial sewing machine needles:

Specialised features: blade, CAE (Scarf) and coatings.
Functions: material penetration to thread control.

The importance of the correct needle selection include the various forms of needle points and sizes:

cloth points   - standard fabrics;
ball points   - knitwear and elasticated fabrics;
cutting points - leathers and plastics.

Systems and types - machine specifications.

2.   Recognition of the basic thread and fabric production principles:

Basic thread production stages for conversion of fibres into yarns:

Natural:

raw materials to the spinning stages of staple yarns for soft, mercenaries, glace (polished) and special thread finishes.

essential twist (amount and "Z" or "S" direction of twist) and its effects on certain yarn and fabric properties, eg. balance and sewability.

Types of spun yarns:

cotton - ply's cords

synthetic - spun, core continuous filament, bulked, air textured, mono-filament, blended.

Yarn count systems:

fixed weight;
fixed length;
cotton, denier, tex and metric counts;
count version factors;

Numbering systems: cotton number;

Make-up (Packaging): cocoon, cop, container, cane, spool, vicop and pre-wound bobbin.

3.   Recognition of the general nature of clothing materials and the parameters which determine their use in the construction of garments:

materials types specific to garments;
different material construction;
general sequence of fibre to fabric conversion.

The basic principles of weaving fabrics:

preparation for weaving: warp yarns; weft yarns;
the primary motions of weaving: shedding; picking;

ancillary motions of weaving: cloth take-up; stop motion; protector devices;
Basic weave patterns and textural characteristics; plain, hopsack, twills, satins etc.

Influence of: drape, elastic and inelastic stretch, resilience, stability, texture, sheerness, weight and handle.

Basic weave construction: head end; warp; weft; selvedge; bias (true-cross); cut end.

Basic principles of warp and weft knitting:

Knitted fabric loop structure.
warp knit - locknit, tricot, double, atlas and satin etc.
weft knit - plain, rib purl and interlock etc.
types of knitted fabrics - plain single and double jersey, laid-in-yarns, cellular structures, and knitted lace etc.

Characteristics relating to: wales; courses.

Basic principles of non-woven and laminated fabrics, basic bonding processes covering: fibre-bonding; thermo-plastic bonding; stitch bonding; adhesive bonding.

Characteristics and uses of laminated and homogeneous fabrics.

Fabric finishing processes: scouring; bleaching; milling; mercerising; raising; stentering; calendering; cropping; printing; dying; crease resisting; sanforising; creping; proofing - water and flame.

4.   Theory and construction of Main British Standard seam types.

        Basic principles of the practical use of the standard machines to produce samples of the BS seam types.
        Controlling the machines and fabric: selection of appropriate machinery, threads and needles; methods and sequence of assembly; competence in joining cut parts; accurate stitching for short and long seams; use of simple guides, folders, hemmers, and templates.

        Diagnostic procedures and remedial methods for seam defects and failure: mechanical; physical; chemical; biological.

        Seam evaluation: inherent factors; angles of seam; use of seams; attachments and work aids; sewing considerations - controlling factors.

5.   Basic production work flow systems and organisational structure required to produce a range of garments or clothing articles.

        Production planning and control processes within the sewing department/section covering: handling time; sewing time; process layout; product layout; work place engineering.

        Operating sequence of work flow and material handling methods/systems covering: manual - bundle - make through and progressive; transporter - storage and selector; overhead - storage and selector; conveyor - continuous and intermittent; line, truck and bin systems.

SUGGESTED LEARNING AND TEACHING APPROACHES

This module should be presented in the sewing room/workshop where the tutor would carefully explain and demonstrate the various techniques using a programme of exercises related to a theme or vocational bias which will interest the student.

The student would follow an activity-based learning approach to become familiar with the technology and machines in question. Students could work singly or in pairs.

In the initial stages the tutor would fully explain and demonstrate each operation or process or machine. Terminology and principles should be introduced in the context of the exercises.

Student activities would be essentially centred on a practical exercise assignment and the tutor would be expected to prepare precise briefs for each assessment exercise.

A set of complete exercises, where applicable, should be available for the students to relate and compare standards.

Information charts and posters relating to needles, threads, fabrics, seams, machines and work aids should be displayed to assist the students with the exercises.

Safety and safe working practices should form an integral part of all instruction. It should be stressed throughout the module that the need for good house-keeping, tidy layout of workplaces, materials, tools and machines is imperative.

09/02/98 JH/AM