-SQA- SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **2140030** **-Session-1990-91**
-Superclass- **WH**

-Title- **CLOTHING MACHINING: MANUFACTURING TECHNOLOGY 3 ($x^1/_2$)**

-DESCRIPTION-

Purpose

This module is designed to provide the student with the knowledge required to develop a systematic analytical approach for dealing with problems relating to manufacturing processes in 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 2140020 Clothing Machining: Manufacturing Technology 2.

Outcomes

The student should:

1. outline methods of diagnosing and eliminating stresses set up in the needle during sewing processes;

2. outline production processes, techniques, specifications and diagnostic procedures used during garment manufacture;

3. outline the physical properties and behavioural characteristics of threads and fabrics during the sewing process;

4. outline the work handling, transportation systems and diagnostic procedures used for garment production.

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 METHODS OF DIAGNOSING AND ELIMINATING STRESSES SET UP IN THE NEEDLE DURING SEWING PROCESSES**

PCs

(a) The outline of methods to combat needle stresses is correct for heat, bending and wear.
(b) The outline of diagnostic and rectification procedures for sewing problems related to stress is correct for:

(i) thread and fabric damage;
(ii) faulty seam construction;
(iii) poor stitch appearance;
(iv) unsatisfactory machine performance;
(v) increased production costs.

IA Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the methods of diagnosing and eliminating stresses set up in the needle during sewing processes.

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

(a) methods of combating needle stress:

heat;
bending;
wear.

(b) diagnostic and rectification procedures related to:

thread and fabric damage;
faulty seam construction;
poor stitch appearance;
unsatisfactory machine performance;
increased production costs.

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).

OUTCOME 2 **OUTLINE PRODUCTION PROCESSES, TECHNIQUES, SPECIFICATIONS AND DIAGNOSTIC PROCEDURES USED DURING GARMENT MANUFACTURE**

PCs

(a) The identification of seams, stitching and neating specifications is correct for the construction of a simple garment.
(b) The identification of the basic machines and work aids is correct for the selected garment.
(c) The selected stitch density, thread type and needle size are correct for the selected garment fabric.
(d) The identification of the methods for picking up, holding and arranging garment parts preparatory to sewing is correct.
(e) The identification of ancillary machine functions; back tacking, thread trimming and stackers is correct.
(f) The outline of diagnostic and rectification procedures for problems related to garment construction is correct for:

(i) seam pucker - structural jamming;
(ii) seam grinning - unbalanced tensions;
(iii) malformed stitches - machine adjustments;
(iv) seam run-offs - work aid adjustments.

IA Objective Test

The student will be set an exercise consisting of objective items to test knowledge of production processes, techniques, specifications and diagnostic procedures used during garment manufacture.

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

(a) basic machine and work aids;
(b) stitch density, thread type and needle size;
(c) ancillary machine functions, back tacking, thread trimming and stackers;

(d) diagnostic and rectification procedures related to:

seam pucker - structural jamming;
seam grinning - unbalanced tensions;
malformed stitches - machine adjustments;
seam run-offs - work and adjustments.

Satisfactory achievement of the Outcome will be based on all the 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 PHYSICAL PROPERTIES AND BEHAVIOURAL CHARACTERISTICS OF THREADS AND FABRICS DURING THE SEWING PROCESS**

PCs

(a) The description of the difference between the characteristics of: woven fabric; knitted fabric and bonded fabric is correct.
(b) The outline of diagnostic and rectification procedures relating to: quality control; sewability and pressing and shrinkage is correct.
(c) The definition of the physical properties of thread is correct.
(d) The testing of thread for performance rating in a sewn sample of work for balance; twist and tensioning effects is correct.
(e) The outline of diagnostic and rectification procedures pertaining to abrasion, needle, sewing and tensioning, is correct.

IA Objective Test

The student will be set an exercise consisting of objective items to test knowledge of the physical properties and behavioural characteristics of threads and fabrics during the sewing process.

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

(a) characteristics of fabrics;
(b) diagnostic and rectification procedures:

balance;
twist;
tensioning effects.

(c) 5 physical properties;

(d) diagnostic and rectification procedures for:

abrasion;
needle;
sewing;
tensioning.

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

OUTCOME 4 **OUTLINE THE WORK HANDLING, TRANSPORTATION SYSTEMS AND DIAGNOSTIC PROCEDURES USED FOR GARMENT PRODUCTION**

PCs

(a) The outline of a range of production system processes is correct.
(b) The identification of rectification procedures for a range of problems relating to work flow systems is correct.
(c) The identification of characteristics and influencing factors is correct for work flow systems.

IA Objective Test

The student will be set an exercise consisting of objective items to test knowledge of work handling, transportation systems and diagnostic procedures used for garment production.

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

(a) 5 production processes;
(b) 5 rectification procedures;
(c) characteristics and influencing factors.

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).

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 manufacturing processes and practical machine operation and the effects produced in relation to the actual performance of the selected needles, fabrics, machine types, work handling and transportation systems:

Corresponding to Outcomes 1-4:

1. Recognition of the stages of stress appropriate to industrial sewing machine needles during the sewing process: stitch formation; fabric and thread damage; machine malfunction; garment operations; seam construction.

   Diagnostic and corrective procedures: specialised features - blade, CAE (scarf) eye, points; cooling methods - air, lubricants, surface finishes and coatings.

2. Recognition of the basic production techniques, machines, work aids and processes for positioning, handling and assembling cut garment parts together.

   Construction specification for making up a simple garment based on:

   (a) Model garment range: dresses - skirts; blouses - shirts; jeans - trousers; jackets - coats; underwear - foundation garments.

   (b) Seam type tolerances and allowances: stitch line; fabric; threads; details.

   (c) Methods and sequence of assembly: positioning; handling; specifications; instructions.

   (d) Needles and threads: types; sizes; finish.

   Machine types and range: purpose; special features; principles of operation; application.

   Standard types: single needle lock - high speed seamers; twin needle lockstitch; zig-zag lockstitch; three-thread overedge; four or five thread overedge; needle positioner and underbed thread trimmer; blind stitch felling; spot baster; single and multi-needle chainstitch;

   Special types: button sewer; bar tacker; buttonholer; profile stretcher; auto jigs; integrated sewing units; memory stitchers.

Any other machines and/or work aids appropriate to selected garments and recognition of the benefits work-aids and attachments give in relation to lower costs, higher productivity, uniform quality and particularly where skilled labour is in short supply.

Diagnostic procedures relating to basic principles of the practical use of the standard machines to produce the BS seam types and the construction of a simple garment covering problems relating to: seam pucker; interply shift; seam grinning; unbalanced stitches; seam run-offs.

Diagnostic procedures relating to: effects of maladjusted work aids; interference by attachment with machine performance; interference of work flow by attachment; incorrect selection of work aid or attachment; garment damage due to work aid or attachment.

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

Appropriate fabrics for chosen garment: sheer and lightweight; medium-weight; heavy-weight; stretch-elasticated; knitted - flat and circular; linings and interlinings; trimmings.

Diagnostic procedures relating to: quality control; flaws and damage; tests - chemical and physical; sewability; pressing and shrinkage.

Physical properties of thread: load, tensile strength; tenacity, loop strength; (ratio), seam strength; elongation extensibility; stress/strain, curve; elasticity, shrinkage; moisture regain, dimensional stability; abrasion resistance.

Performance ratings: synthetics compared to natural; seams and garment construction.

Colour fastness standards: grey scales; light fastness; wash fastness; ISO tests.

Diagnostic and rectification procedures pertaining to: abrasion; working being done - fabric - seam; needle to thread relationship; machine threading; sewing speed - stitch density; lubrication condition; tension setting.

4. Production planning and control of work flow processes within the clothing factory department covering: line balancing - skills required; machinery and equipment - line set up; work in progress - single or bulk production; direct and indirect staffing - supervision; training - labour turnover; maintenance - servicing and installation of machinery and work aids.

Systems characteristics: supervision; use of labour; order sequence; style and quantity variations; production and handling time; use of work aids; space utilisation; appearance;
installation costs and upkeep; quality level; advantages and disadvantages.

Influence of factors: balancing; discipline; quality;
through-put time; flexibility; minimum handling; minimum space; neat appearance; realistic cost.

Diagnostic procedures relating to: the operation sequence of work flow and material handling methods/systems incorporated in the production of garments.

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 questions. 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, work aids and handling and transportation systems 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