



# Curriculum Framework

Bookbinding Merchandised and Cutting



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## 1 Introduction:

Bookbinding Mechanised and Cutting is a well established and defined trade in a fast growing industry. Technological advancement in the last decade has left the only structured mode of learning, namely apprenticeships, far behind.

It has therefore become necessary to address the currency and quality of the curriculum for apprenticeships.

The introduction of the amendment to the Skills Development Act has also strongly influenced the approach to this curriculum framework. There is a shift from the established Competency Based Modular Training system to an Outcomes Based approach.

In addition to the shift to Outcomes Based education, there is also a shift to strong occupationally based exit level outcomes. In an attempt to recognise occupations within the trade qualifications, previously unrecognised occupations like machine assistants, guillotine operators and the like, will now find a recognised and formalised learning path.

The qualification framework also addresses the inclusion/exclusion of certain processes within the trade by using **elective** exit level outcomes. This will enable the employer and the apprentice to define the learning path that the apprentice will specialise in based on the company equipment and the apprentice areas of interest.

## 2 Background:

The Printing and Packaging industries have a legacy of above average artisan training. Implementation of apprentice training has gradually evolved from a time-based apprenticeship with the option to do a voluntary trade test, to CBMT (Competency Based Modular Training) and now there is an inevitable shift to Outcomes Based training.

This evolution in delivery modes has strived to improve the control over context and quality of learning. The benefit of Outcomes Based training lies in an approach that has a strong focus on occupations and the fundamental, core and elective learning that will enable the learner to not only master a skill, but apply it in a fast developing economy.

In order to compete in the global economy, the apprenticeship system and its curricula has to transform into a mode of delivery that will produce artisans who are knowledgeable, skilled and adaptable with strong critical thinking and problem solving abilities.

This curriculum framework is the culmination of the best technical experts and curriculum development experts applying a clean slate approach without discarding the work previously done by advisory groups and technical committees.



### 3. Purpose of the qualification:

This qualification is to be registered at level 3 / 4 on the National Vocational Qualifications framework.

It is designed to equip learners with an integrated practical and theoretical grounding in the basic principles and practices of Bookbinding Mechanised and Cutting.

It will equip learners to be able to successfully complete the finishing processes within a range of printing industry contexts.

It will include broad areas of learning including, the impact of printing on the environment and the basics of mechanical, pneumatical, hydraulic and electronic equipment.

Learners acquiring this qualification will demonstrate competencies across areas including maintenance and the operation of high speed bookbinding machinery, and various ancillary operations.

Further to these qualifying learners will be able to specialise in various elective components which will include hard case bookbinding, quarter binding and stationary binding.

The fundamental learning will prepare the learner for the business environment, communication, mathematical, scientific and computer abilities together with life skills.

Learners completing this qualification will be able to operate proficiently in this fast growing high speed finishing environment.

#### Learning to be assumed to be in place:

Learners will be assumed to be competent in the following abilities:

Using Science and Technology	NQF level 2 / grade ten
Solving mathematical problems	NQF level 2 / grade ten
Literacy & Numeracy	NQF level 2 / grade ten



#### 4 **Range Statement:**

The learning will cover all aspects of the trade / related trades limited to the printing industry. The learning will cover all aspects of the bookbinding mechanised operation, related practices such as environmental, health and safety and all related theoretical underpinning knowledge.

The learning is intended to act as an entry level programme, initiating a potential career in the printing industry. The learning in this qualification will not cover subject matter at an advanced level (assumed to be contained in a future programme designed for advanced / technician studies.

The learning will be primarily practical or on site training with the learner exposed to theoretical training in traditional 'block release programmes.

#### 5 **Assumptions:**

This Qualification Framework assumes that learners will be in possession of a minimum of a grade ten qualification?

Learners will be assessed to determine whether they have the aptitude to deal with the level of learning required;

The level of reading / writing and arithmetic assumed to be in place will be at a NQF level of 2 or the minimum of a grade ten;

The printing industry will continue to require the trades to be defined narrowly in a functional specific manner as Bookbinding as an example;

The industry will define trades in two levels, one of technicians for more complex environments and one of trades for more rudimentary purposes of learning;

Learning will be provided by a range of learning providers, but primarily by the industry accepted 'colleges' of learning for the foundational aspects and by the workplace providers and workplace context;

Learners will be assigned to accredited workplaces to complete there workplace context learning requirements;

The qualification framework will serve as a guide until such time as the vocationally based qualification frameworks are released / approved by the relevant ETQA;

**6 Criteria for inclusions / Exclusions:**

<b>Inclusion Criteria:</b>	<b>Exclusion Criteria:</b>
<p>Core book binding processes;            Broad underpinning knowledge to ensure flexibility;            Critical cross field outcomes to be provided through delivery modality;            Generic applications;            Minimum plant practices such as overall operating procedures / health &amp; safety / small groups, etc.</p>	<p>Plant specific training requirements;            Dated machine technologies (to be covered by plant specific training if required);            Plant specific applications / technologies;            International Best Practices            (Learners should be able to carry special credits but not required for minimum pass rates)</p>



## 7 Applied Competence (Exit Level Outcomes)

Fundamental		Core		Elective	
8.	Demonstrate an understanding of the printing industries impact on the <b>environment</b>				
7.	Demonstrate and understanding basic printing <b>science</b>	7.	Understand the <b>adhesive binding</b> process and demonstrate competence in binding various products.	7.	Understand and perform <b>inline inkjet</b> printing operations.
6.	Apply basic <b>mathematical</b> calculations specific to the printing environment	6.	Understand the <b>saddle stitching</b> process and demonstrate competence in binding various products.	6.	Demonstrate competence in <b>ancillary relief</b> applications to various materials.
5.	Demonstrate an understanding of production <b>economics</b> for a printing / bookbinding operation.	5.	Demonstrate competency in <b>gathering</b> folded sections and leaves for different binding processes.	5.	Demonstrate competence in binding various <b>hard case finishing</b> products
4.	Demonstrate an understanding of the principles of <b>mechanical</b> , pneumatic, hydraulic and electronic components of bookbinding equipment.	4.	Operate various <b>folding equipment</b> , demonstrating the use of various folding methods.	4.	Demonstrate competence as a <b>stationary finishing</b> specialist
3.	Demonstrate an understanding of printing <b>industry processes</b> , terms, concept and principles.	3.	Demonstrate the operation of a <b>guillotine</b> for various job requirements.	3.	Understand the operation and function and demonstrate competence in <b>mailing room</b> processes
2.	Demonstrate an understanding of basic <b>computer skills</b> and the use of Graphic User Interface equipment.	2.	Understand Pre-planning processes for various <b>bookbinding methods</b> .	2.	Demonstrate competence as a <b>quarter binding</b> finishing specialist.
1.	Demonstrate an understanding of <b>company policies</b> and procedures as applied to your specific work area.	1.	Understand different <b>paper handling</b> operations in a bookbinding environment.	1.	Demonstrate competence in various print finishing <b>surface coating</b> techniques

**8 Specific Outcomes****Fundamental Outcomes:****Exit Level Outcomes:**

**F1:** Demonstrate an understanding of company policies and procedures as applied to your specific work area.

<b>Specific Outcome:</b>	
SP1:	They must have a basic understanding of discipline, grievance & appeals.
SP2:	A basic understanding of the company policies.
SP3:	A basic understanding of basic health and safety act as applied to their workplace.
SP4:	A basic First Aid understanding.
SP5:	A basic understanding of HIV & AIDS.
SP5:	An Understanding of company structure, roles and responsibilities of their reporting line.
SP6:	An understanding of basic legislation as applied to their role.

**Exit Level Outcomes:**

**F2:** Demonstrate an understanding of basic computer skills and the use of Graphic User Interface equipment.

<b>Specific Outcome:</b>	
SP1:	Learners must have an understanding of computer hardware and peripherals.
SP2:	An basic understanding of the computer operating system.
SP3:	A basic understanding of mail applications and the internet.
SP4:	A basics understanding of MS Office applications.
SP5:	Understand the basics of (GUI) graphic user interface applications.



**Exit Level Outcomes**

**F3:** Demonstrate an understanding of printing industry processes, terms, concept and principles. (Induction to printing)

<b>Specific Outcome:</b>	
SP1:	An overview of the history of the entire printing industry.
SP2:	Understand the production flow of the publishing environment.
SP3:	Understand the pre-press processes and environment.
SP4:	An understanding of the major printing processors and their markets.
SP5:	Understand the history, current state and future of finishing.

**Exit Level Outcomes:**

**F4:** Demonstrate an understanding of the principles of mechanical, pneumatic, hydraulic and electronic components of bookbinding equipment.

<b>Specific Outcome:</b>	
SP1:	Understand basic mechanical principles.
SP2:	Understand the basic principles of pneumatics.
SP3:	Understand the basic principles of hydraulics.
SP4:	Understand the basic principles of electronic components.
SP5:	Understand the basics of problem solving techniques.
SP5:	Understand maintenance aspects in the bookbinding environment.



**Exit Level Outcomes:**

**F5:** Demonstrate an understanding of production economics for a printing / bookbinding operation.

<b>Specific Outcome:</b>	
SP1:	Understanding the cost implications of raw materials.
SP2:	Understand the cost implications of labour costs and value added costs.
SP3:	Understand the cost implications of maintenance and replacement.
SP4:	Understand the basics of estimating.
SP5:	Understand work tickets.

**Exit Level Outcomes:**

**F6:** Apply basic **mathematical** calculations specific to the printing environment

<b>Specific Outcome:</b>	
SP1:	Understand arithmetic.
SP2:	Understand basic algebra applied to the printing industry.
SP3:	Understand basic geometry applied to the printing industry.
SP4:	Understand units of measurement methods.



**Exit Level Outcomes:****F7:** Demonstrate and understanding of basic printing science

<b>Specific Outcome:</b>	
SP1:	An understanding of basic science.
SP2:	An understanding of heat and humidity.
SP3:	Understand the properties of fluids.
SP4:	Understand chemical types and reactions.
SP5:	Understand PH in printing.
SP6:	Understand light and colour.
SP7:	Understand metals.
SP8:	Understand the properties and principles of inks, varnishes and adhesives.

**Exit Level Outcomes:****F8:** Demonstrate an understanding of the printing industries impact on the environment.

<b>Specific Outcome:</b>	
SP1:	Have a good understanding of waste management.
SP2:	Have a good understanding of pollution.
SP3:	Have a good understand of supplier accreditation.
SP4:	Have a good understanding of energy management.



**Core Outcomes:****Exit Level Outcomes:**

**C1:** Understand different Paper handling operations in a bookbinding environment.

<b>Specific Outcome:</b>	
SP1:	Understand the manufacturing process,
SP2:	Understand paper characteristics and problems relating to paper.
SP3:	Understanding international paper sizes.
SP4:	Understand paper handling methods.

**Exit Level Outcomes:**

**C2:** Understand Pre-planning processes for various bookbinding methods.

<b>Specific Outcome:</b>	
SP1:	Understand how to determine the difference between binding methods.
SP2:	Understand how to choose the correct method applicable for a specific job.
SP3:	Understanding of materials used in bookbinding.



**Exit Level Outcome:**

**C3:** Demonstrate the operation of a guillotine for various job requirements.

<b>Specific Outcome:</b>	
SP1:	Understanding the terminology, principles, methods and products in a guillotine department.
SP2:	Understand the operating principles, maintenance and safety aspects of a guillotine.
SP3:	Understand the procedure in setting up a job.
SP4:	Understand the procedure in guillotining a job.
SP5:	Maintain outputs and quality control.
SP6:	Record, identify and pack finished product according to job specifications.

**Exit Level Outcomes:**

**C4:** Demonstrate adequate knowledge and skill in the operation of folding equipment and folding methods.

<b>Specific Outcome:</b>	
SP1:	Understand the terminology, principles, methods and products in the folding environment.
SP2:	Understand the operating principles, maintenance and safety aspects of a guillotine.
SP3:	Pre-flight.
SP4:	Make ready and set-up the folding machine.
SP5:	Run, maintain outputs and quality control.
SP6:	Record, identify and pack finished product according to job specifications.



**Exit Level Outcomes:**

**C5:** Demonstrate competency in gathering folded sections and leaves for different binding processes.

<b>Specific Outcome:</b>	
SP1:	Pre-flight
SP2:	Understand the operating principles, maintenance and safety aspects of a guillotine.
SP3:	Make ready and set-up the gathering machine.
SP4:	Run, maintain outputs and quality control.
SP5:	Record, identify and pack finished product according to job specifications.

**Exit Level Outcomes:**

**C6:** Understand the saddle stitching process and demonstrate competence in binding various products.

<b>Specific Outcome:</b>	
SP1:	Understand the principles, methods and products relevant to the saddle stitchers.
SP2:	Understand the operating principles, maintenance and safety aspects of a saddle stitcher.
SP3:	Pre-flight
SP4:	Make ready and set-up the saddle stitcher.
SP5:	Run, maintain outputs and quality control.



**Exit Level Outcomes:**

**C7:** Understand the Adhesive binding process and demonstrate competence in binding various products.

<b>Specific Outcome:</b>	
SP1:	Understand the principles, methods and products relevant to the adhesive binders.
SP2:	Understand the operating principles, maintenance and safety aspects of an adhesive binder.
SP3:	Understand characteristics and different types of adhesives.
SP4:	Pre-flight
SP5:	Make ready and set-up the adhesive binder.
SP6:	Run, maintain outputs and quality control.
SP7:	Record, identify and pack finished product according to job specifications.



## Elective Outcomes:

### Exit Level Outcomes:

**E1:** Demonstrate competence in various print finishing surface coating techniques

<b>Specific Outcome:</b>	
SP1:	Understand the principals, materials and procedures used to Varnish various products.
SP2:	Set, make-ready and run the varnishing machine to production specifications.
SP3:	Understand the principals, materials and procedures used to laminate products.
SP4:	Set, make-ready and run the Film Laminating machine to production specifications.
SP5:	Run, maintain outputs and quality control.
SP6:	Record, identify and pack finished product according to job specifications.

### Exit Level Outcomes:

**E2:** Demonstrate competence as a quarter binding finishing specialist.

<b>Specific Outcome:</b>	
SP1:	Understand the procedure and use of materials and tools to quarter bind a book.
SP2:	Understand the process and applications to perforate, drill, number, index, score, gluing and counting of various products.
SP3:	Maintain outputs and quality control.
SP4:	Record, identify and pack finished product according to job specifications.



**Exit Level Outcomes:**

**E3:** Understand the operation and function and demonstrate competence in mailing room processes

<b>Specific Outcome:</b>	
SP1:	Understand the principles, methods and products relevant to the mail room solution.
SP2:	Understand the operating principles, maintenance and safety aspects of the equipment.
SP3:	Pre-flight
SP4:	Make ready and set-up the equipment.
SP5:	Run, maintain outputs and quality control.
SP6:	Record, identify and pack finished product according to job specifications.

**Exit Level Outcomes:**

**E4:** Demonstrate competence as a stationary finishing specialist

<b>Specific Outcome:</b>	
SP1:	Understand the principals, materials and procedures used for stationary binding.
SP2:	Set, make-ready and run the various equipment to production specifications.
SP3:	Understand the characteristics and properties of raw materials i.e. plastic, paper, board and adhesives.
SP4:	Understand the operating principles, maintenance and safety aspects of the equipment.
SP5:	Pre-flight
SP6:	Make ready and set-up the equipment.
SP7:	Run, maintain outputs and quality control.
SP8:	Record, identify and pack finished product according to job specifications.



**Exit Level Outcomes:**

**E5:** Demonstrate competence in binding various hard case finishing products.

<b>Specific Outcome:</b>	
SP1:	Understand the terminology, principals, methods and products of a Hard Case bookbinding environment.
SP2:	Understand and operate the end paper machine.
SP3:	Sew the gathered sections to specification
SP4:	Smash sewn book blocks to compress and level the spine.
SP5:	Backline the sewn book block using the appropriate method and material
SP6:	Set and operate the 3 knife trimmer
SP7:	Apply decorative elements to the book block according to the client specifications
SP8:	Manufacture the case for casing in.
SP9:	Draw the case over the prepared book block
SP10:	Set up the book former in order to create the French groove.
SP11:	Set up the book former in order to create the French groove.
SP12:	Complete final decorative and quality steps in order to finish the bound book.

**Exit Level Outcomes:**

**E6:** Demonstrate competence in ancillary relief applications to various materials.

<b>Specific Outcome:</b>	
SP1:	Understand the principals, materials and procedures used in hot foil stamping.
SP2:	Set, make-ready and run the foiling machine to production specifications.
SP3:	Understand the principals, materials and procedures used for embossing and die cutting.
SP4:	Set, make-ready and run the embossing / die cutting machine to production specifications.
SP5:	Run, maintain outputs and quality control.
SP6:	Record, identify and pack finished product according to job specifications.



**Exit Level Outcome:****E7:** Understand and perform inline inkjet printing operations.

<b>Specific Outcome:</b>	
SP1:	Understand the configuration of various inline inkjet printing equipment.
SP2:	Perform setup of inkjet printing equipment where relevant.
SP3:	Operate inkjet printing equipment during a production run.
SP4:	Critically address any problems that can occur on inline inkjet printing equipment.
SP5:	Perform maintenance on inline inkjet printing equipment.



**9. Critical Cross Field Outcomes:**

1	Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made;	✓✓✓
2	Working effectively with others as a member of a team, group, organisation, community;	✓
3	Organising and managing oneself and one's activities responsibly and effectively;	✓
4	Collecting, analysing, organising and critically evaluating information;	✓
5	Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion;	✓
6	Using science and technology effectively and critically, showing responsibility towards the environment and health of others;	✓✓
7	Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation;	✓
8	Contributing to the full personal development of each learner and the social and economic development of the society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of: Reflecting on and exploring a variety of strategies to learn more effectively; Participating as responsible citizens in the life of local, national and global communities; Being culturally and aesthetically sensitive across a range of social contexts; Exploring education and career opportunities; and Developing entrepreneurial opportunities.	✓ ✓ ✓

## 10 Learning Map (Proposed structure of learning)

In order for an apprentice to qualify in Bookbinding Mechanised and Cutting it is necessary to complete the whole fundamental component, the whole core component and a choice of **at least three electives** based on the companies equipment and the chosen field of specialisation.

The following occupations within the qualification can also be completed as skills programmes.

### 10.1. Guillotine Operator

In order for a learner to gain recognition as a guillotine operator in the Bookbinding Mechanised and Cutting environment it is necessary to complete the following core and fundamental exit level outcomes.

Fundamental Exit Level Outcomes
<b>F1</b> Demonstrate an understanding of company policies and procedures as applied to your specific work area.
<b>F2</b> Demonstrate an understanding of basic computer skills and the use of Graphic User Interface equipment.
<b>F3</b> Demonstrate an understanding of printing industry processes, terms, concept and principles.
<b>F4</b> Demonstrate an understanding of the principles of mechanical, pneumatic, hydraulic and electronic components of bookbinding equipment.
<b>F5</b> Demonstrate an understanding of production economics for a printing / bookbinding operation.
<b>F6</b> Apply basic mathematical calculations specific to the printing environment
Core Exit Level Outcomes
<b>C1</b> Demonstrate the operation of a guillotine for various job requirements.
<b>C2</b> Understand Pre-planning processes for various bookbinding methods.
<b>C3</b> Demonstrate the operation of a guillotine for various job requirements.
Elective Exit Level Outcomes
No electives required.



## 10.2. Folding Machine Operator

In order for a learner to gain recognition as a Folding Machine Operator in the Bookbinding Mechanised and Cutting environment it is necessary to complete the following core and fundamental exit level outcomes.

<b>Fundamental Exit Level Outcomes</b>
<p><b>F1</b> Demonstrate an understanding of company policies and procedures as applied to your specific work area.</p> <p><b>F3</b> Demonstrate an understanding of printing industry processes, terms, concept and principles.</p> <p><b>F4</b> Demonstrate an understanding of the principles of mechanical, pneumatic, hydraulic and electronic components of bookbinding equipment.</p> <p><b>F5</b> Demonstrate an understanding of production economics for a printing / bookbinding operation.</p> <p><b>F6</b> Apply basic mathematical calculations specific to the printing environment</p>
<b>Core Exit Level Outcomes</b>
<p><b>C1</b> Understand different Paper handling operations in a bookbinding environment.</p> <p><b>C4</b> Operate various folding equipment, demonstrating the use of various folding methods.</p>
<b>Elective Exit Level Outcomes</b>
<p>No electives required.</p>



### 10.3. Saddle Stitching Machine Operator

In order for a learner to gain recognition as a Saddle Stitch Machine Operator in the Bookbinding Mechanised and Cutting environment it is necessary to complete the following core and fundamental exit level outcomes.

<b>Fundamental Exit Level Outcomes</b>
<b>F1</b> Demonstrate an understanding of company policies and procedures as applied to your specific work area.
<b>F2</b> Demonstrate an understanding of basic computer skills and the use of Graphic User Interface equipment.
<b>F3</b> Demonstrate an understanding of printing industry processes, terms, concept and principles.
<b>F4</b> Demonstrate an understanding of the principles of mechanical, pneumatic, hydraulic and electronic components of bookbinding equipment.
<b>F5</b> Demonstrate an understanding of production economics for a printing / bookbinding operation.
<b>F6</b> Apply basic mathematical calculations specific to the printing environment
<b>Core Exit Level Outcomes</b>
<b>C1</b> Understand different Paper handling operations in a bookbinding environment.
<b>C2</b> Understand Pre-planning processes for various bookbinding methods.
<b>C5</b> Demonstrate competency in gathering folded sections and leaves for different binding processes.
<b>C6</b> Understand the saddle stitching process and demonstrate competence in binding various products.
<b>Elective Exit Level Outcomes</b>
No electives required.



#### 10.4. Adhesive Binding Machine Operator

In order for a learner to gain recognition as a Adhesive Binding Machine Operator in the Bookbinding Mechanised and Cutting environment it is necessary to complete the following core and fundamental exit level outcomes.

<b>Fundamental Exit Level Outcomes</b>
<p><b>F1</b> Demonstrate an understanding of company policies and procedures as applied to your specific work area.</p> <p><b>F2</b> Demonstrate an understanding of basic computer skills and the use of Graphic User Interface equipment.</p> <p><b>F3</b> Demonstrate an understanding of printing industry processes, terms, concept and principles.</p> <p><b>F4</b> Demonstrate an understanding of the principles of mechanical, pneumatic, hydraulic and electronic components of bookbinding equipment.</p> <p><b>F5</b> Demonstrate an understanding of production economics for a printing / bookbinding operation.</p> <p><b>F6</b> Apply basic mathematical calculations specific to the printing environment</p> <p><b>F7</b> Demonstrate and understanding basic printing science.</p> <p><b>F8</b> Demonstrate an understanding of the printing industries impact on the environment</p>
<b>Core Exit Level Outcomes</b>
<p><b>C1</b> Understand different Paper handling operations in a bookbinding environment.</p> <p><b>C2</b> Understand Pre-planning processes for various bookbinding methods. <b>C5</b> Demonstrate competency in gathering folded sections and leaves for different binding processes.</p> <p><b>C7</b> Understand the Adhesive binding process and demonstrate competence in binding various products.</p>
<b>Elective Exit Level Outcomes</b>
No electives required.



## 11 References

- Current registered apprentice course maps and training programmes
- Work done by advisory committees.
- GATF training programme.
- Heidelberg handbook of print media
- Printing Science by F. Pateman & L. C Young
- Sappi resource material.
- Internet resources.

## 12 Review Period

This curriculum, once approved should be subject to the monitoring and continuous improvement guidelines and policies of the South African Qualifications Authority.

This would imply continuous improvement as technology evolves and a formal review every three years.



**14 Definitions**

CBMT	Competency based modular training
ETQA	Education training quality assurance body
Apprenticeship	A formally registered tri-party contract that culminates into a qualified artisan.
Skills Programme	A credit or non-credit bearing formal learning programme.
Exit Level Outcome	A group of specific standards, knowledge and skills defined as an outcome.
Fundamental	An underpinning knowledge component that supports the gaining of skills.
Core	The essential skills and knowledge based training component.
Elective	A field of specialisation within the formal training programme.
NQF	National Qualifications Framework.
VQF	Vocational Qualifications Framework.
Occupation	A combination of knowledge and skills that culminate in a recognised job.

