



## BACKGROUND

Manufacturing is the process of transforming raw materials into new products. Manufacturing thus means "making things." Whether it is cell phones, computers, motor vehicles or plastic bottles, manufactured products are conceived, conceptualised, designed, created and maintained. The creation of new products happens in different stages starting with the design of the product, followed by the production of the tools required to manufacture the specific product and finally the application of the tools to manufacture the product because manufacturing cannot take place without tooling.

The design and production of these manufacturing tooling are done by highly skilled people known as toolmakers. They use advanced machines and equipment to produce precision tools such as jigs, moulds and dies which are then used in the manufacturing process of products. Toolmakers are employed in all manufacturing sectors from aerospace, automotive, chemical and electronics to the marine, medical, packaging and mining industries.

The PtSA TDM Powered Toolmaker Apprenticeship Programme provides toolmaker training at world-class accredited PtSA Centres of Excellence in Pretoria, Cape Town, Gqeberha and Pietermaritzburg. The centres boast conventional and advanced tooling manufacturing skills development infrastructure such as computer-aided design, manufacturing and engineering programmes and machines.

PtSA is a membership-based organisation with the mission of promoting, protecting and supporting the collective interests of the Tool, Die, Mould and Special Machining Industries of South Africa in continual support of the growth and development of all manufacturing sectors. PtSA is the only Association which focusses exclusively on the TDM Industry in South Africa and has a partnership agreement with government to support the TDM Industry.



## WHO WOULD BE A GOOD CANDIDATE FOR A CAREER IN TOOLING MANUFACTURING?

Careers in tooling manufacture involve work activities that require a practical aptitude and involve the use of sophisticated computer-controlled equipment and machinery.

Candidates for a career in toolmaking must have the ability to visualise the product from a drawing and prefer responsibilities with a technical focus. They must enjoy work activities that present mathematical and scientific challenges.

## THE PtSA TDM POWERED TOOLMAKER APPRENTICESHIP TRAINING PROGRAMME

### MINIMUM ENTRY REQUIREMENTS

Interested applicants must have successfully completed one of the following National Qualification Framework (NQF) Level 4 qualifications:

- Grade 12 with Mathematics (35%), Physical Science (35%) and English (40%)
- NC(V)4 with Mathematics (40%), Physical Science (50%) and English (40%)
- N3 with Mathematics (40%), Engineering Science (40%) as well as Gr 12 or NC(V)4 English (40%)

### SELECTION FOR THE PtSA TDM POWERED TOOLMAKER APPRENTICESHIP PROGRAMME

To be selected into the PtSA TDM Powered Toolmaker Apprenticeship Programme, applicants must complete the application form and submit it on or before the specified closing date. Selected applicants will be interviewed and if successful, will participate in a final assessment for selection.

### THE PROGRAMME

#### The Occupational Certificate: Toolmaker

On successful completion of the Toolmaker Trade Test the student will be awarded The Occupational Certificate: Toolmaker (NQF Level 05) – SAQA ID 103177. The Programme is modular and competency-based (not time-based) with a typical duration of 4 years (full time study) to achieve the Occupational Certificate: Toolmaker.



The design of the PtSA TDM Powered Toolmaker Apprenticeship Programme allows students to enter and exit the Programme at different stages enabling them to complete credential modules over a period of time.

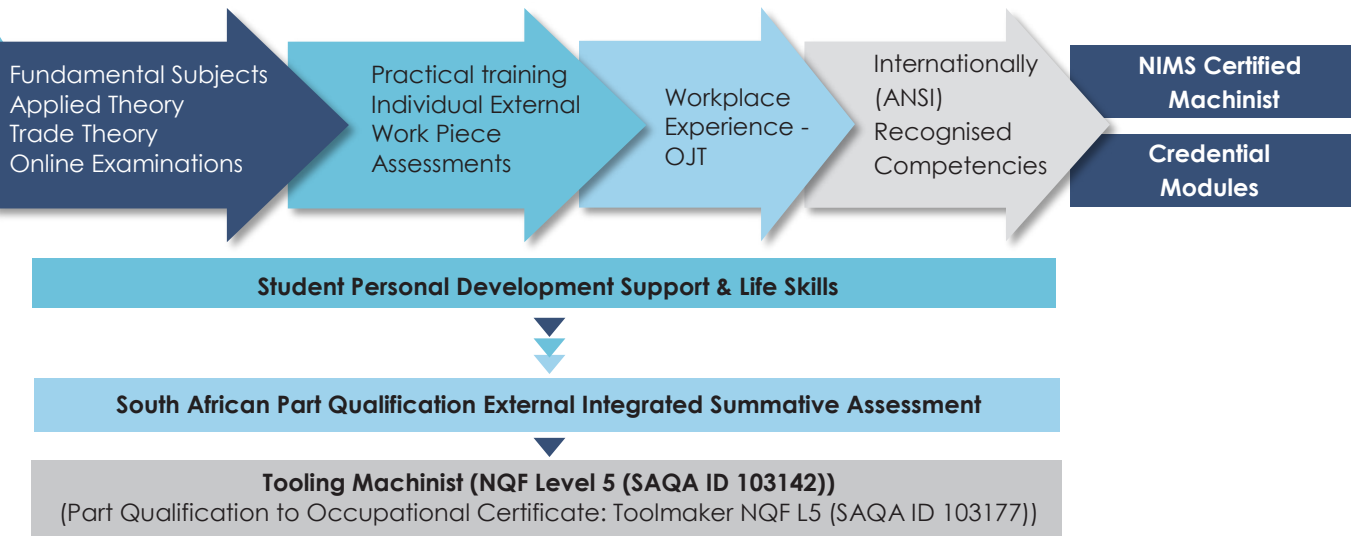
### Tooling Machinist

Specialised machining has always been a part of tool, die and mouldmaking. The industry therefore has a significant need for trained machinists. A student who, for any reason, is unable to complete the PtSA TDM Powered Toolmaker Apprenticeship Programme can still obtain a part qualification as Tooling Machinist. This qualification consists of a specific number of conventional and advanced machining credential modules successfully completed by the student.

This allows students to exit at different levels and be employable prior to completing a full qualification. On successful completion of the Tooling Machinist External Integrated Summative Assessment the candidate will be awarded **NQF Level: 05 Occupational Certificate: Tooling Machinist (NQF Level 05) SAQA ID 103142.**

The Programme is modular and competency-based (not time-based) with a typical duration of 3 years (full time study) to achieve the Tooling Machinist qualification.

## Tooling Machinist Programme 3 years – competency-based

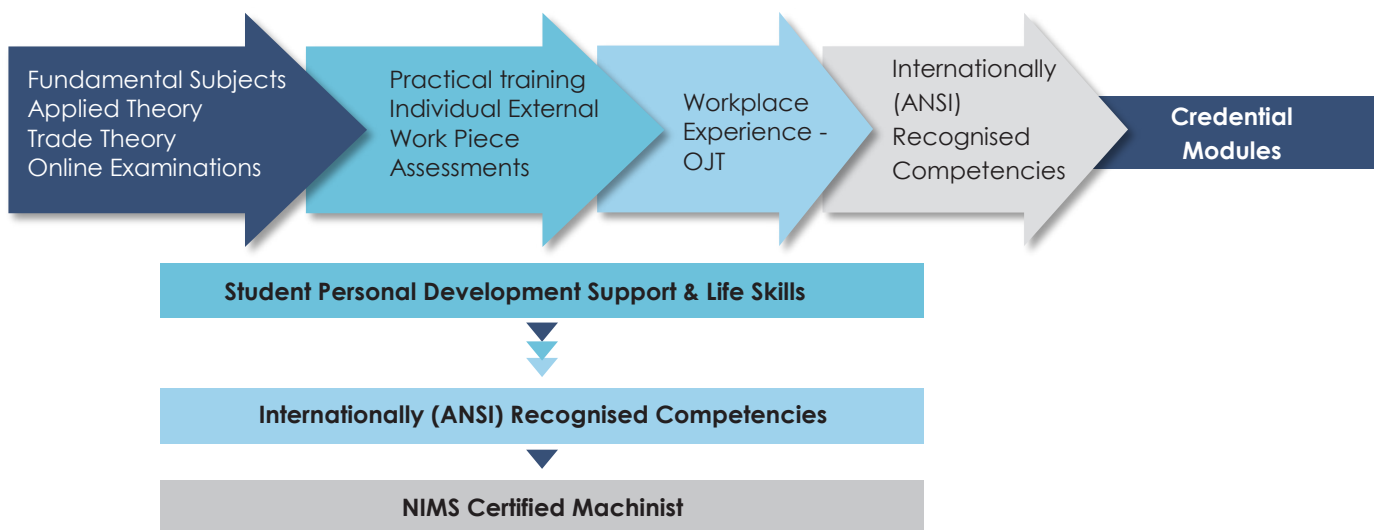


### National Institute of Metalworking Skills (NIMS) Certified Machinist

The NIMS Certified Machinist qualification is an international qualification and forms the core of the tooling and machining qualifications offered by the PtSA TDM Powered Toolmaker Apprenticeship Programme.

On successful completion of the NIMS Certified Machinist Programme the candidate will be awarded **the NIMS Certified Machinist** qualification. The Programme is modular and competency-based (not time-based) with a typical duration of 2.5 years (full time study) to achieve the NIMS Certified Tooling Machinist qualification.

## NIMS Certified Machinist Programme 2,5 years – competency-based



### Credential Modules

Specific competencies required for machinist and toolmaker qualifications can be attained by completion of stand-alone modules. Credential modules create the opportunity for earlier employability during a student's journey towards a full qualification.

Students who have dropped out but have successfully completed some credentials will get recognition and will be able to work in the industry. A credential job duty comprises of a practical element (a work piece complying with set quality standards), relevant machining theory assessed through an online examination and specific On-the-Job Training (OJT) duties.



## COURSE CONTENT

The following table provides an overview of the content of the course.

Occupational Certificate: Toolmaker (NQF L5) SAQA ID 103177		
Knowledge Modules		
Level I	Level II	Level III
<b>Trade Theory I</b>	<b>Trade Theory II</b>	<b>Trade Theory III</b>
Applied subjects Safety MMS JPBL Introduction to Machining Mathematics	CAD I Plastics Processing I  Metal Pressing, Blanking and Drawing I	CAD II Plastics Processing II  Metal Pressing, Blanking and Drawing II
Project Management I CNC Milling Theory & Simulation I CNC Turning Theory & Simulation I	Project Management II	Project Management III Enterprise Resource Planning Manufacturing Economics
Practical Modules		
Job Planning, Benchwork and Layout (JPBL) Measurement, Materials and Safety (MMS) Drill Press I Turning Operations Chucking I Turning Operations Between Centres I Milling I Grinding Skills I Welding CNC Turning I CNC Milling I	Turning Operations Chucking II Turning Operations Between Centres II Milling II Grinding Skills II CNC Turning II CNC Milling II EDM Wire II EDM Plunge II	Metal Pressing Project Plastics Processing Project
OJT—Workplace Experience		
Register for Trade Test		

Pre-requisite for Trade Test

## PARTNERSHIP FOR SKILLS DEVELOPMENT

To strengthen South Africa's capacity to produce tool, die, mould and special machining skills, the TDM industry, as represented by PtSA, partnered with the Department of Trade, Industry and Competition (**the dtic**) to form the **INTSIMBI** Future Production Technologies Initiative (IFPTI).

The Initiative was designed to meet the demands of the South African manufacturing industry for high-tech future-orientated toolmaking skills.

The PtSA TDM Powered Toolmaker Apprenticeship Programme is presented by PtSA Management Services (Pty) Ltd.

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