

Certificate in Mechanical Engineering - Apprenticeship



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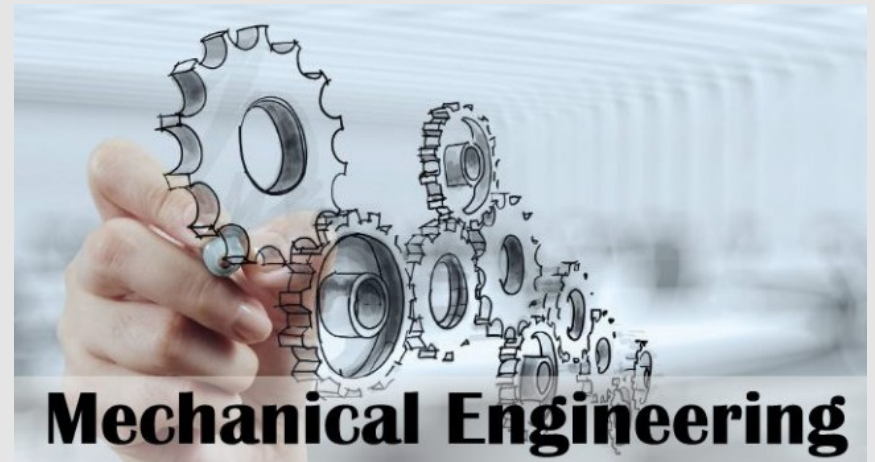
Seychelles Institute of Technology (SIT)

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Certificate in Mechanical Engineering - Apprenticeship

TVET PROGRAMME



Mechanical Engineering

Purpose

The purpose of this award is to enable the learner to attain the standard required to achieve the Certificate at level 3 on the National Qualifications Framework (NQF) through acquisition of the knowledge, mastery of skill and attitudes essential in Mechanical Engineering. It is aimed at learners who work or want to work in the Mechanical industry. This training can also offer the learner the opportunity to specialize in a particular Area/field such as Gas & Arc welding, Engineering materials etc.

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Introduction

The Certificate in Mechanical Engineering is a **one-year** (1200hours) training programme offered full-time or **18 months** on Apprenticeship training mode to secondary five (S5) school leavers and mature learners. This is equivalent to just over three(3) semesters.

To qualify for the certificate, a learner has to successfully complete all the required units/courses on the programme. Total number of credits to be accumulated is 120 credits.

A graduate with the Certificate in Mechanical Engineering is one who can perform duties in welding and have basic workshop skills as an apprentice in Mechanical Engineering under direct supervision.

Entry Criteria

Learners wishing to apply for the Certificate Mechanical Engineering must have attained a minimum score of **40%** at the National Examinations in the following subjects: General English, General Mathematics and General Science.

Others: Records of Achievement Or Successfully completed TVET program with 40%

Learners should be able to:

- ⇒ Apply health, safety and security procedures in the context of mechanical engineering.
 - ⇒ Maintain mechanical engineering tools and instruments.
 - ⇒ Demonstrate knowledge of the occupation of a mechanical engineer in the context of Seychelles.
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Career Opportunities in the Mechanical Engineering Industry

Career Opportunities in the Mechanical Engineering Industry exists. A graduate mechanical engineer will work with new technologies, for example advanced materials, new manufacturing processes or highly efficient cooling systems, converting demanding requirements into optimized production component designs. Later in their careers they might be leading the innovation of these technologies, for example the composite . Alternatively, they may be leading engineering teams that apply those technologies to the next generation of power systems.

Most of the graduate roles in the fast-moving consumer goods industry are in one of two areas: manufacturing/engineering or supply network operations/logistics. For both of these areas, the work is not defined in nice separate buckets of mechanical, electrical, chemical etc., but is normally a mixture of different engineering disciplines as a general manufacturing or logistics engineer. Graduates will pick up skills from other disciplines as they go through their training and career.

A mechanical engineer in the materials and metals industry will be involved in the design, development and testing of a range of complex mechanical systems. They will work on the full maintenance lifecycle of the mechanical plant items (steam turbines, gas turbines, pumps, valves, pipework, coal mills, fans etc.)

Progression and Further Studies

Graduates on the Certificate in Mechanical Engineering can apply for the Advanced certificate and later the National Diploma in Mechanical Engineering.

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Assessment Technique (s) including weighting (s)

The Certificate grade is based on a weighted average of all unit result grades. Assessment approach varies from one unit to another. During every unit of study there is a minimum number of continuous assessments which the learner must undertake. This could be in the form of small tests and assignments. For the final unit assessments, in most cases a learner will have to sit for both a theory paper which can be multiple choice, structured or a mixture and a practical for skills demonstration.

Work based experience (WBE) is a compulsory unit and is assessed by the supervisor in the work place for the apprenticeship learners and through compilation of a portfolio and assessed against the performance criteria for the different elements in the WBE unit for learner on part-time.

To attain the required standard, a minimum of a pass grade must be achieved in all assessments prescribed .

Pass mark for every unit on the programme is **55%**.

As per SIT Assessment Policy, the final mark for a unit is made up of 40% of all continuous assessments plus 60% from the results of the final unit assessment (s) and the following grades and corresponding marks are used

Not yet Competent- NYC	-	0—54%
Pass	- P	-55%-69%
Credit or Merit	- M or C	-70% - 84%
Distinction	- D	-85%+

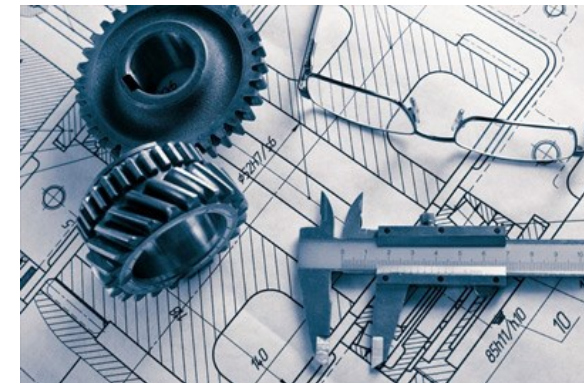
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- ⇒ Demonstrate knowledge of engineering materials and their properties.
- ⇒ Apply knowledge of electrical circuits.
- ⇒ Apply principles and practices of electrical and electronics applications
- ⇒ Use oral and written English in the context of mechanical engineering
- ⇒ Apply mathematical principles.
- ⇒ Demonstrate knowledge of basic arc welding
- ⇒ Demonstrate understanding of basic gas welding

Certification

To be awarded a certificate in the Certificate in Mechanical Engineering programme the learner must have achieved the expected performance criteria set out in the different elements of each unit that make up the programme. The total credit requirement for this Certificate is 120 Credits .

This qualification is a level 3 on the National Qualification Framework (NQF).

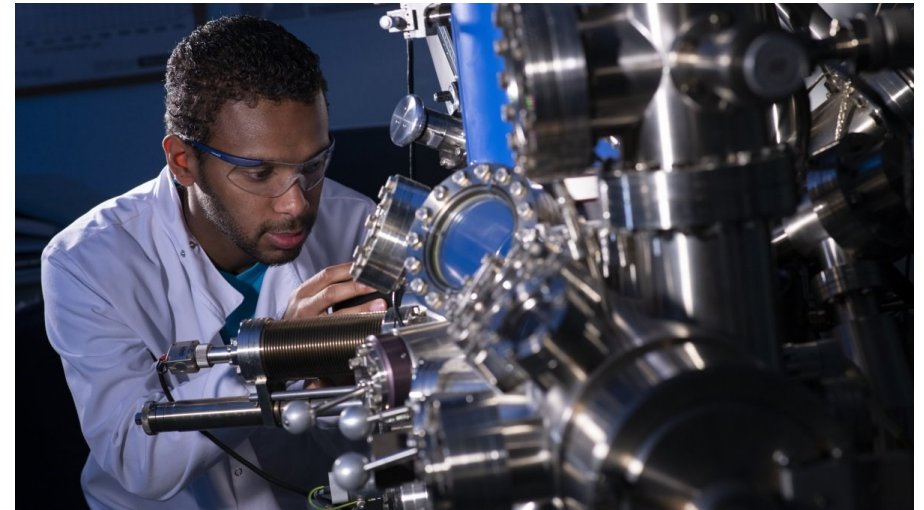


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List of Statements of Competencies

Statement of Competencies	Unit title	Semester (s) involved	Credits
1. Apply health, safety and security procedures in the context of mechanical engineering	Health, Safety and security procedures	1	4.5
2. Maintain mechanical engineering tools and instruments	Tools and Instruments	1	4.5
3. Demonstrate knowledge of the occupation of a mechanical engineer in the context of Seychelles	Occupation of a Mechanical Engineer	1	3
4. Demonstrate knowledge of engineering materials and their properties	Engineering materials	1 & 2	4.5
5. Apply knowledge of electrical circuits	Electromagnetism	2	4.5
7. Use oral and written English in the context of mechanical engineering	Technical English	1	3.0
8. Apply mathematical principles	Mathematics	1	3.0

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Structure of the Programme:

	Semester 1	Semester 2	Semester 3
	Health, Safety and Security Procedures (30/15)	Basic Engineering Science (30/15)	Sheet Metal work (50/25)
	Basic Engineering Materials (30/15)	Basic Mathematics (20/10)	Gas Welding (60/30)
	Engineering Tools & Instruments (30/15)		Electromagnetism (30/15)
	Basic Arc Welding (60/30)	Machining & Fittings (60/60)	
	Mechanical Engineering Occupation (20/10)		
	Technical English (20/10)	Basic Information Communication Technology (20/10)	
	Basic Technical Drawing Techniques 1 (20/10)	Basic Technical Drawing Techniques 2 (20/10)	
		Work Based Experience (W.B.E rotation 1) 210	Work Based Experience (W.B.E rotation 2) 210
	Number of contact hours / Non-contact hours per semester		
	Semester one: 210/105 (315) Notional Hours (210+105) = 315	Semester two: 150/105 (255) Notional Hours (150+105+210) = 465	Semester three: 140/70 (210) Notional Hours (140+70+210) = 420
	Total hours for the 18 months program: 1200		

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9. Apply knowledge and skills of basic arc welding	Basic Arc welding	1	9.0
10. Apply knowledge and techniques of basic gas Welding	Basic Gas Welding	2	9.0
11. Use information and communication technology (ICT) skills	ICT	2	3.0
12. Apply knowledge and techniques of machining and fittings	Machining and Fittings	2	12.0
13. Apply principles and practices of sheet metal work	Sheet metal work	2	7.5
14. Apply principles and practices of technical drawing	Basic Technical drawing Techniques	1 & 2	6.0
15. Apply knowledge and skills of Mechanical Engineering during work based experience (WBE)	Work based experience (WBE)	2& 3	42.0
Total number of credits			120

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Training Resources Required for Study

- Learners are expected to have drawing equipment such as ruler, Tri Square, T-Square, protractors.
- Overall and safety shoes are mandatory in the Mechanical workshop.



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Books and References for Study

A number of publications are available for study and training in the Certificate in Mechanical Engineering. They are books which are regularly updated with new editions. Learners are advised to identify the latest versions.

The following are available in the SIT Library and can be borrowed for study and references:

- An Introduction to technical Drawing, A. Yarwood
- Technical Drawing for G.C.E and C.S.E, J.N Green
- Mathematics for technicians New level 1 A.Greer and G.W.Taylor
- Maintenance Engineering Handbook by Lindley Higgins and Keith Mobley
- Plant Equipment & Maintenance, Engineering Hand book by Duncan C. Richardson
- GCSE Additional Applied Science Student Book by Nuffield/ York.
- Physical Metallurgy: Principle and Practice, V. Raghavan. Prentice Hall India Pvt Ltd.
- Machine Tool Technology by K S Yadav
- Industrial Safety & environment, Anupana Prashav
- Engineering Fundamentals, Roger Timings
- Mechanical Workshop Practice by K. C. JOHN
- Sheet Metal Work (Workshop Practice) by R.E. Wakeford
- Basic Welding and Fabrication W Kenyon

The following websites contain journals and articles on mechanical engineering:

- <http://www.academicjournals.org/journal/JMER>
 - <http://www.ccsenet.org/journal/index.php/mer>
 - <http://journals.sagepub.com/home/ade>
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