



# **ENGINEERING PROGRAMMES**

**ZAMBIA QUALIFICATIONS FRAMEWORK (ZQF) - LEVEL 6**

## **SYLLABUS**

**FOR**

**DIPLOMA  
IN**

**AUTOMATION AND INFORMATION  
TECHNOLOGY**

**Programme No. 409**

**Prepared by:**

**Curriculum Development Unit,  
Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA)  
P/Bag RW 16X,  
Birdcage Walk,  
Lusaka**

**Phone: +260211253211  
E-mail: [teveta@teveta.org.zm](mailto:teveta@teveta.org.zm)**

Approved February 2019

**TABLE OF CONTENTS**

<b>1.0 ABOUT TEVETA .....</b>	<b>IV</b>
<b>2.0 ACKNOWLEDGEMENTS .....</b>	<b>IV</b>
<b>3.0 RATIONALE .....</b>	<b>VI</b>
<b>4.0 PROGRAMME PURPOSE .....</b>	<b>VI</b>
<b>5.0 PROGRAMME OUTCOMES .....</b>	<b>VI</b>
<b>6.0 PROGRAMME DURATION .....</b>	<b>VII</b>
<b>7.0 PROGRAMME OUTLINE .....</b>	<b>VII</b>
<b>8.0 TEACHING/LEARNING STRATEGIES .....</b>	<b>VIII</b>
<b>9.0 PROGRAMME EVALUATION .....</b>	<b>VIII</b>
<b>10.0 TRAINEE ENTRY REQUIREMENTS: .....</b>	<b>IX</b>
<b>11.0 ASSESSMENT .....</b>	<b>IX</b>
<b>12.0 ATTENDANCE .....</b>	<b>IX</b>
<b>13.0 PROGRESSION REQUIREMENTS .....</b>	<b>IX</b>
<b>14.0 STAFFING .....</b>	<b>X</b>
<b>15.0 CERTIFICATION .....</b>	<b>X</b>
<b>MODULE: 409-01-A WORKSHOP PROCESSES AND PRACTICES .....</b>	<b>1</b>
<b>MODULE: 409-02-A ENGINEERING MATHEMATICS I .....</b>	<b>30</b>
<b>MODULE: 409-03-A COMMUNICATION SKILLS .....</b>	<b>46</b>
<b>MODULE: 409-04-A INTRODUCTION TO COMPUTERS .....</b>	<b>61</b>
<b>MODULE: 409-05-A COMPUTER NETWORKING FUNDAMENTALS .....</b>	<b>73</b>
<b>MODULE: 409-06-A ELECTRICAL FUNDAMENTALS .....</b>	<b>84</b>
<b>MODULE: 409-07-A ANALOGUE ELECTRONICS .....</b>	<b>100</b>
<b>MODULE: 409-08-A ENTREPRENEURSHIP .....</b>	<b>110</b>
<b>MODULE: 409-09-B ENGINEERING MATHEMATICS II .....</b>	<b>136</b>
<b>MODULE: 409-10-B AUTOCAD DRAWINGS .....</b>	<b>144</b>
<b>MODULE: 409-11-B ELECTRICAL MACHINERY TECHNOLOGY .....</b>	<b>160</b>
<b>MODULE: 409-12-B PROGRAMMABLE LOGICAL CONTROLLERS(PLC) FUNDAMENTALS .....</b>	<b>172</b>
<b>MODULE: 409-13-B DIGITAL ELECTRONICS .....</b>	<b>183</b>
<b>MODULE: 409-14-B PHOTOSHOP IMAGE DESIGN .....</b>	<b>196</b>
<b>MODULE: 409-15-B PRINCIPLES AND APPLICATIONS OF SINGLE-CHIP ....</b>	<b>211</b>
<b>MODULE: 409-16-C MANAGEMENT AND ORGANISATION .....</b>	<b>224</b>
<b>MODULE: 409-17-C DESIGN OF HUMAN MACHINE INTERFACE .....</b>	<b>233</b>
<b>MODULE: 409-18-C MACROMEDIA FLASH ANIMATION DESIGN .....</b>	<b>243</b>
<b>MODULE: 409-19-C PROGRAMMABLE LOGICAL CONTROLLER (PLC) CONTROL SYSTEMS TECHNOLOGY .....</b>	<b>256</b>
<b>MODULE: 409-20-C ADVANCED OFFICE .....</b>	<b>268</b>

**ACRONYMS**

A.P	Arithmetic progressions
AC	Alternating Current
BJT	Bipolar Junction Transistors
BJT	Bipolar Junction Transistors
CAD	Computer Aided Drawing
CB	Common-Base Configuration
CBPC	Beijing Polytechnic College China
CC	Common Collector configuration
CE	Common Emitter Configuration
CLM	China Luanshya Copper Mine
DC	Diode circuits with Direct Current
E&I	Electrical and Instrumentation
FETS	Field Effect Transistors
G.P	Geometric progressions
HMI	Human Machine Interface
KCM	Konkola Copper mine Plc
LAN	Local Area Network
LED	Light Emitting Diodes
NORTEC	Northern Technical College
PCB	Printed Circuit Board
PIPO	Parallel-In/Parallel-Out
PISO	Parallel-In/Serial-Out
PLC	Programmable Logical Controllers
RMS	Root Mean Squares
R-S	Reset-set
SCR	Sequence Control Relay
SCR	Silicon controlled rectifiers
SCRs	Silicon Controlled Rectifiers
SIPO	Serial-In/Parallel-out
SISO	Serial-In/Serial-Out
TEVETA	Technical Education Vocational and Entrepreneurship Training Authority
TIA	Totally Integrated Automatic
UJT	Unijunction Transistors
VLAN	Virtual Local area network
WAN	Wide area network
www	World Wide Web

## 1.0 ABOUT TEVETA

The Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) is an institution established under TEVETA Act No. 13 of 1998 read together with the Amendment Act No. 11 of 2005. Its functions include, to regulate, coordinate and monitor education, vocational and entrepreneurship training in consultation with stakeholders.

TEVETA executes its regulatory function through the provision of services, among others, the development, review and approval of TEVETA Curricula in consultation with industry, employers, employees and other stakeholders.

## 2.0 ACKNOWLEDGEMENTS

The Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) wishes to express sincere appreciation to the following persons who participated in the development of the Syllabus for Diploma in Automation and Information Technology.

S/N	NAME	POSITION	ORGANISATION
1.	Liang Chimin	Director	Sino . Zam Vocational College of Science and Technology (SZVCST)
2.	Song Kai	Secretary General	National Nonferrous Metals Vocational Education and Teaching Guidance Committee
3.	Zhou Yan	Vice President	Beijing Polytechnic College, China (CBPC)
4.	Tang Zhengqing	Director of International Affairs	CBPC
5.	Liu Wenlong	Director of Teaching Affairs	CBPC
6	Li Jiong	Vice Director of	CBPC
7	Wang Wei	International Affairs	CBPC
8	Jia Minzheng	Vice Dean	CBPC
9	Zhang Puqing	Vice Dean	CBPC
10	Zhang Mingzhu	Curriculum Specialist	CBPC
11	Wang Jun	Curriculum Specialist	CBPC
12	Wang Xianhong	Curriculum Specialist	CBPC
13	Tang Yuyan	Curriculum Specialist	CBPC
14	Cheng Wei	Curriculum Specialist	CBPC
15	Xie Ligao	Curriculum Specialist	CBPC
16	Liu Lihong	Curriculum Specialist	CBPC
17	Song Yu-e	Curriculum Specialist	CBPC
18	Deng Yun	Curriculum Specialist	CBPC
19	Wang Miao	Curriculum Specialist	CBPC
20	Xu Peng	Curriculum Specialist	CBPC

21	Li Xueyan	Curriculum Specialist	CBPC
22	Yang Deliang	Curriculum Specialist	CBPC
23	Suo Yangyang	Curriculum Specialist	CBPC
24	Zhang Li	Curriculum Specialist	CBPC
25	Zhao Yuansu	Curriculum Specialist	CBPC
26	Meng Qing	Curriculum Specialist	CBPC
27	Yamvwa Jorick	Principal	SZVCST
28	Wildie Mutelo	Lecturer- Electrical/	NORTEC
29	Chilufya Mwanza	Lecturer- Communication Skills	Sino . Zam Vocational College of Science and Technology (SZVCST
30	Pathias Melele	E & I Engineer	Konkola Copper Mine
31	Kennedy Bowa	Manager- Curriculum Development	TEVETA
32	Chansa Nachilima	CDS	TEVETA
33	Liang Chimin	Director	
34	Wang Nan	Lecturer	PVETZ
35	Ding HuLin	Lecturer	SZVCST SZVCST

TEVETA would also like to express sincere appreciation to China Luanshya Copper Mine (CLM), for providing the technical and financial support to develop this curriculum.