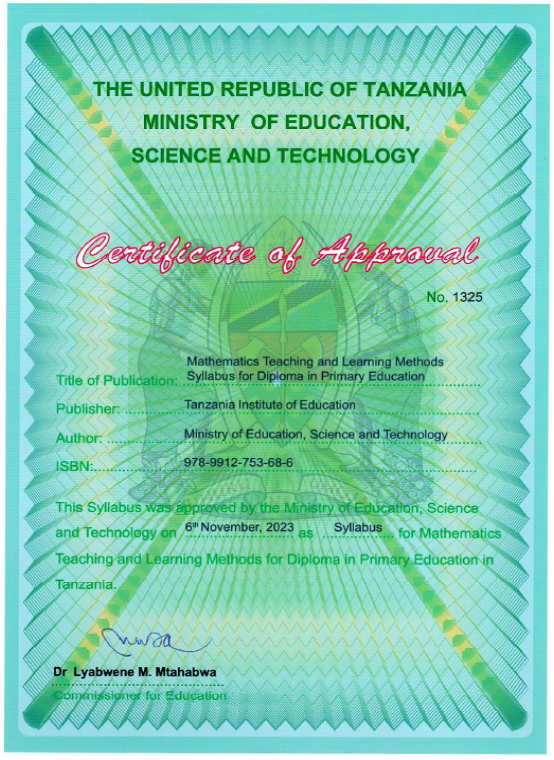
THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY


THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION,
SCIENCE AND TECHNOLOGY

Certificate of Approval

No. 1325

Title of Publication: Mathematics Teaching and Learning Methods Syllabus for Diploma in Primary Education

Publisher: Tanzania Institute of Education

Author: Ministry of Education, Science and Technology

ISBN: 978-9912-753-68-6

This Syllabus was approved by the Ministry of Education, Science and Technology on 6th November, 2023 as Syllabus for Mathematics Teaching and Learning Methods for Diploma in Primary Education in Tanzania.

Dr Lyabwene M. Mtahabwa
Commissioner for Education

MATHEMATICS TEACHING AND LEARNING METHODS SYLLABUS FOR DIPLOMA IN PRIMARY EDUCATION

2023

© Tanzania Institute of Education 2023

Published 2023

ISBN: 978-9912-753-68-6

Tanzania Institute of Education
Mikocheni Area
132 Ali Hassan Mwinyi Road
P.O. Box 35094
14112 Dar es Salaam

Phone: +255 735 041 168/ 735 041 170
E-mail: director.general@tie.go.tz
Website: www.tie.go.tz

This document should be cited as Ministry of Education, Science, and Technology (2023). *Mathematics teaching and learning methods syllabus for diploma in primary education.* Tanzania Institute of Education.

All rights reserved. No part of this syllabus may be reproduced, stored in any retrieval system or transmitted in any form or by any means, be it electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Commissioner for Education, Ministry of Education, Science and Technology.

Table of Contents

List of Tables....iv
Abbreviations and Acronyms.... v
Acknowledgements.... vi
1.0 Introduction.... 1
2.0 The Main Objectives of Education in Tanzania.... 1
3.0 Objectives of Teacher Education.... 2
3.1 Main Objective of Teacher Education....2
3.2 Specific Objectives of Teacher Education....2
4.0 General Competences of Teacher Education for Diploma in Primary Education.... 3
5.0 Main and Specific Competences.... 3
6.0 Roles of aTutor, Student-Teacher and Parent/Guardian in Teaching and Learning.... 4
6.1 The tutor.... 4
6.2 The student teacher.... 5
6.3 The parent/Guardian.... 5
7.0 Methods of Teaching and Learning.... 5
8.0 Teaching and Learning Resources.... 6
9.0 Assessment.... 6
10.0 Number of Periods.... 7
11.0 Teaching and Learning Content.... 7
Bibliography.... 18

List of Tables

Table 1: Main and Specific Competences in First and Second Year 4
Table 2: Distribution of Continuous Assessment Marks in Percentage 7
Table 3: First Year Contents 8
Table 4: Second Year Contents 15

Abbreviations and Acronyms

ICT	Information and Communications Technology
TIE	Tanzania Institute of Education
MoEST	Ministry of Education Science and Technology

Acknowledgements

Writing of Mathematics Teaching and Learning Methods Syllabus for Diploma in Primary Education involved various experts from both public and private institutions. The Tanzania Institute of Education (TIE) would like to thank all experts who participated in the writing of the syllabus: lecturers, tutors, school quality assurance officers, teachers, and curriculum developers from TIE. The Institute is also grateful to the National Technical Committee formed by the Minister for Education, Science and Technology for coordinating the curriculum review process for Pre-primary, Primary, Secondary and Teacher education. The Committee discharged its responsibilities professionally to ensure that the contents of this syllabus are in line with the 2023 curricular review main objective. The review sought to ensure that graduates acquire skills, knowledge and attitude that enable them to create self-employment, employ others, be employed and sustain themselves.

Finally, in a special way, TIE would like to thank the Ministry of Education, Science and Technology for facilitating preparation and distribution of this syllabus.

Dr Aneth A. Komba

Director General

Tanzania Institute of Education

1.0 Introduction

Mathematics is a compulsory subject for Diploma in primary Education Plogramme. Mathematics teaching and learning methods for diploma in primary education is the syllabus that enables a student teacher to demonstrate mastery of the curriculum of Primary Education, analyse the curriculum and cross-cutting issues, as well as interpret the curriculum into teaching and learning using ICT and other assistive technologies. Also, the syllabus aims to enable the student-teacher to acquire the knowledge, skills and attitudes that will make them creative, flexible and able to facilitate teaching and learning based on student's needs.

This syllabus has been prepared to guide the teaching and learning of mathematics methods at the Diploma in Primary Education level in Tanzania Mainland. The syllabus interprets the teaching and learning of competences indicated in the 2023 Diploma in Primary Education Curriculum. Also, it provides instructions to guide tutors on how to prepare a student teacher effectively. The teaching and learning process includes using participatory methods, preparing lessons, and preparing teaching and learning resources. The syllabus also interprets a 2023 Diploma in Primary Education Curriculum, which aims at preparing a teacher with competent knowledge, skills and values that will enable him/her to be self-dependent and use effectively the available opportunities for being employed or self-employment, and have full control on his/her everyday life.

2.0 The Main Objectives of Education in Tanzania

The main objectives of providing education in Tanzania are to enable every Tanzanian to:

(a) Develop and improve his or her personality so that he or she values himself or herself and develops self-confidence;

(b) Respect the culture, traditions and customs of Tanzania, cultural differences, dignity, human rights, attitudes and inclusive actions;

(c) Develop knowledge and apply science and technology, creativity, critical thinking, innovation, cooperation, communication and positive attitudes for personal development and the sustainable development of the nation and the world at large;

(d) Understand and protect national values, including dignity, patriotism, integrity, unity, transparency, honesty, accountability and the national language;

(e) Develop life and work-related skills to increase efficiency in everyday life;

(f) Develop a habit of loving and valuing work to increase productivity and efficiency in production and service provision;

(g) Identify and observe cross-cutting issues, including the health and well-being of society, gender equality, as well as the management and sustainable conservation of the environment; and

(h) Develop national and international cooperation, peace and justice according to the Constitution of the United Republic of Tanzania and international conventions.

3.0 Objectives of Teacher Education

3.1 The Main Objective of Teacher Education

The main objective of teacher education is to prepare a professional and competent teacher who can embrace teaching and learning that correspond with the scientific, technological and social changes for the purpose of preparing a Tanzanian citizen who is well equipped with knowledge, skills, and positive attitudes, and who respects human rights, equality and lifelong learning.

3.2 Specific Objectives of Teacher Education

The specific objectives of teacher education are to enable a student teacher to:

(a) Develop a theoretical understanding of teacher education, ethics of the teaching profession, life ethics, and teaching foundations;

(b) Develop competence in teaching and learning methods;

(c) Develop competence in assessment and evaluation methods based on the concept of competence development;

(d) Develop innovation and creativity in teaching and learning while considering the pupils' needs;

(e) Apply ICT and assistive technology in teaching and learning;

(f) Develop skills for early identification of pupil with special needs and provide appropriate intervention;

(g) Strengthen the use of language in teaching and learning; and

(h) Develop skills that focus on improving teaching, learning and assessment (i.e., classroom-based research)

4.0 General Competences of Teacher Education for Diploma in Primary Education

The general competence of Teacher Education for Diploma in Primary Education aims at enabling a student teacher to:

(a) Apply teaching theories and foundations in teaching and learning;

(b) Master teaching and learning methods;

(c) Master the methods for assessment and evaluation based on competence development;

(d) Master the methods for innovation and creativity in teaching and learning based on pupil's needs

(e) Use ICT and assistive technology in teaching and learning;

(f) Identify a pupil with special needs and provide appropriate intervention;

(g) Use a relevant language appropriately in teaching and learning;

(h) Apply leadership skills in academics (i.e., instructional leadership); and

(i) Demonstrate mastery of the skills for improving teaching, learning and assessment (i.e., classroom-based research).

5.0 Main and Specific Competences

The main and specific competences to be developed by student-teacher are presented in Table 1.

Table 1: *Main and Specific Competences in First and Second Year*

Main competence	Specific competence
1.0 Demonstrate mastery of the methods for teaching and learning Mathematics in Primary Education	1.1 Demonstrate mastery of the methods for teaching and learning the concept of numbers 1.2 Demonstrate mastery of the methods for teaching and learning measurements, shapes and algebra 1.3 Demonstrate mastery of improvisation and application of technology and other assistive tools in teaching and learning Mathematics 1.4 Demonstrate mastery of teaching and learning methods in statistics and finance. 1.5 Demonstrate mastery of the methods for teaching and learning Mathematics outside the classroom.

6.0 Roles of aTutor, Student-Teacher and Parent/Guardian in Teaching and Learning

The teaching and learning process depends on collaboration among the tutor, student teacher and parent/guardian. Their roles are described in the following subsection.

6.1 The tutor

The tutor is expected to:

(a) Promote teaching and learning based on 21st-century skills. This includes methods that will make a student teacher the centre of learning. Some of the recommended methods are those that help the student teacher develop the ability to think, reflect, and seek knowledge from various sources to solve teaching and learning challenges;

(b) Create an enabling teaching and learning environment, including improvisation of the resources;

(c) Provide a fair and equitable fostering environment to student teachers regardless of their differences; and

(d) Identify the student teacher's special needs and provide him/her with appropriate support.

6.2 The student teacher

The student teacher is expected to:

(a) Participate effectively in training activities inside and outside the classroom to ensure that he or she develops appropriate competence in various areas, including classroom management and instructional and assessment methods.

(b) Participate in continuous training at nearby schools to apply the learning theories.

(c) Participate in a one-year internship under the guidance of experienced teachers to strengthen competence and professionalism/expertise in the teaching profession;

(d) Collaborate with fellow student teachers and the tutor in the learning process; and

(e) Comply with the college rules and regulations.

6.3 The parent/Guardian

The parent/guardian is expected to:

(a) Supervise and monitor the student teacher's behaviour and his/her academic/learning progress; and

(b) Provide the student teacher with the requirements and learning materials.

7.0 Methods of Teaching and Learning

The mathematics teaching and learning methods syllabus for the diploma in primary education emphasises the use of teaching and learning methods that make a student-teacher a centre of learning, while a tutor serves as a facilitator. The tutor should use interactive methods that will enable the student teacher to develop the intended competence. Such methods include but not limited to songs, stories, role-plays, sports and games, demonstrations, gallery tours, excursion/study tours, research and group discussions. These methods will enable the student teacher to think critically, communicate, collaborate, seek knowledge from various sources, be creative, and solve various challenges in the teaching and learning process.
The tutor is advised to guide the student teacher to be creative and flexible in using participatory methods during the teaching practice and to improvise teaching and learning tools based on the pupil's needs and real environment.

8.0 Teaching and Learning Resources

Teaching and learning resources should be interactive and fulfil the learning needs. The tutor should use the tools that enable the student teacher to use multiple sense organs while learning. Such tools will make the student-teacher develop curiosity, discovery and critical thinking behaviour. The tutor is also advised to improvise and use the tools available in the surrounding environment, such as computers, printers, tablets, discs, texts related to the subject matter, fiction and non-fiction texts, graphics, photographs, audio, television, film, radio, physical objects, and a dictionary.

9.0 Assessment

Assessing will be based on the criteria for the progress assessment of a student-teacher in competence development. The student-teacher will be assessed based on teaching activities, including lesson plan preparation, improvisation of teaching and learning resources, teaching practice and both continuous and summative assessments, and providing feedback. The tutor should examine the student teacher in all aspects of testing domains, which are knowledge (cognitive), skills (psychomotor) and attitudes/values (affective).

In addition, it is important to examine the student teacher's progress to determine the level of performance reached in all aspects of learning.

Assessment of progress will be based on criteria defined in each learning activity. The tools designed to be used in assessment include exercises, oral questions, tests, questionnaires, portfolios, diaries, assignments, class presentations, and end-of-term exams. Similarly, the tutor should design diverse assessment activities to stimulate learning. The final assessment will contribute seventy percent (70%), while continuous assessment will contribute thirty percent (30%). The student teacher must pass the continuous assessment with at least 50% and at the same level in the final assessment to be awarded a certificate. Failure to attain the scores, the student teacher can re-sit the examination twice within three years. Table 2 shows the distribution of marks for continuous assessment.

Table 2: *Distribution of Continuous Assessment Marks in Percentage*

Assessment activities	Distribution (%)
First Year Terminal Examination	6.0
First Year Annual Examination	6.0
Second Year Terminal Examination	6.0
Project	7.0
Portfolio	5.0
Total	**30**

10.0 Number of Periods

This syllabus estimates the time spent on teaching and learning based on the weight of specific competences and activities to be performed by the student teacher. The estimated time is based on the periods-allocation system from which each period carries 60 minutes. The subject has a total of five periods per week.

11.0 Teaching and Learning Content

This syllabus is organised into six components: main competence, specific competence, learning activities, assessment criteria, teaching and learning resources and the number of periods. The First and Second Year content is presented in Tables 3 and 4.

Table 3: *First Year Contents*

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of the methods for teaching and learning Mathematics in Primary Education	1.1 Demonstrate mastery of the methods for teaching and learning the concept of numbers	(a) Mastery application of games, puzzles, and number charts in teaching and learning mathematical concepts	Games, puzzles, and number charts in teaching and learning mathematical concepts are correctly applied	Flip charts, mark pens, counters, Abacuses, rulers, number trays, numerical illustrations, and online programmes related to the concept of number	70
		(b) Demonstrate mastery of using various methods of teaching and learning mathematical concepts in large classes	Various methods of teaching and learning mathematical concepts in large classes are effectively used	Flip charts, marker pens, microphones, and speakers, various texts used in teaching large classes	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(c) Demonstrate mastery of methods for integrating cross-cutting issues in teaching and learning numbers-related concepts.	Methods of integrating cross-cutting issues in teaching and learning concepts related to numbers are employed accurately	Flip charts, marker pens, Manila cards, and various texts related to cross-cutting issues	
		(d) Demonstrate mastery of methods for integrating ICT in teaching and learning concepts related to numbers	Methods of integrating ICT in teaching and learning concepts related to numbers are appropriately demonstrated	Programmes related to integrating ICT, digital tools, application software, and online programmes focusing on integration ICT techniques.	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(e) Demonstrate mastery of employing alternative teaching and learning methods of concepts related to numbers	Alternative teaching and learning methods concepts related to numbers are appropriately demonstrated	Online programmes related to teaching concepts related to numbers, digital tools, application software, charts and graph paper, flip charts, numerical illustrations, abacuses, and various texts about teaching techniques for the concepts related to numbers	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
	1.2 Demonstrate mastery of the methods for teaching and learning measurements, shapes and algebra	(a) Demonstrate mastery of using arts and games in teaching and learning measurements, shapes, and algebra.	The use of arts and games in teaching and learning measurements, shapes, and algebra is appropriately demonstrated	Flip charts, marker pens, application software, Manila cards, geometric kits, shape drawings, measuring tape, and geoboard	
		(b) Demonstrate mastery of employing various teaching and learning methods for concepts of measurements, shapes, and algebra in large classes	Diverse teaching and learning methods for the concepts of measurements, shapes, and algebra in large classes are appropriately demonstrated	Flip charts, marker pens, computers, smartphones, tablets, projectors, microphones, and speakers, various texts related to teaching in large classes	70

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(c) Demonstrate mastery of integrating cross-cutting issues in teaching and learning measurements, shapes, and algebra	Integration of cross-cutting issues in teaching and learning measurements, shapes, and algebra are appropriately demonstrated	Flip charts, marker pens, past examinations, manila cards, various texts related to cross-cutting issues	
		(d) Demonstrate mastery of integrating ICT methods in teaching and learning measurements, shapes, and algebra	The integration of ICT in teaching and learning concepts of measurements, shapes, and algebra is appropriately demonstrated	Online programmes related to integrating measurements, shapes, algebra, and applications	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(e) Demonstrate mastery of employing alternative teaching and learning methods for measurements, shapes, and algebra	Various teaching and learning methods for measurements, shapes, and algebra are appropriately employed	Digital tools, application software, charts and graph paper, shape drawings, tape measure, beam balances, flip charts, marker pens, real objects and ruler	
	1.3 Demonstrate mastery of improvisation and application of technology and other assistive tools in teaching and learning Mathematics	(a) Demonstrate mastery of improvisation of simple assistive tools in teaching and learning Mathematics	Simple assistive tools in teaching and learning Mathematics are properly improvised	Wooden pieces, empty water bottles, bottle caps, clay, Manila cards, grain seeds, knives, scissors, boxes, rope, thread, and other materials found in the environment	20

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(b) Demonstrate mastery of using technology and other assistive tools in teaching and learning Mathematics	Technology and other assistive tools for teaching and learning Mathematics are appropriately used	Online programmes focusing on the use of technology in teaching and learning Mathematics	

Table 4: *Second Year Contents*

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
1.0 Demonstrate mastery of the methods for teaching and learning Mathematics in Primary Education	1.4 Demonstrate mastery of teaching and learning methods in statistics and finance	(a) Demonstrate mastery of methods for using arts and games, charts and graphs in teaching and learning statistics and finance	Methods for using arts and games, charts, and graphs in teaching and learning statistics and finance are appropriately demonstrated	Flip charts, mark pens, charts and graph paper, Manila cards, various texts about methods and techniques for teaching and learning statistics and finance	110
		(b) Demonstrate mastery of using various teaching and learning methods in statistics and finance in large classes	Various teaching and learning methods in statistics and finance in large classes are appropriately demonstrated	Flip charts, mark pens, projectors, microphones and speakers, various texts related to teaching large classes	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
		(c) Demonstrate mastery of integrating cross-cutting issues in teaching and learning statistics and finance	The integration of cross-cutting issues in teaching and learning statistics and finance is appropriately demonstrated	Flip charts, mark pens, past examinations, Manila cards, and texts related to cross-cutting issues.	
		(d) Demonstrate mastery of integrating ICT methods in teaching and learning statistics and finance	The integration of ICT in teaching and learning statistics and finance is appropriately demonstrated	Digital tools, online programmes related to teaching and learning statistics and finance	
		(e) Demonstrate mastery of employing alternative teaching and learning methods for statistics and finance	Other methods of teaching and learning statistics and finance are appropriately demonstrated	Online programmes related to teaching statistics and finance, charts and graph paper, shape drawings, tape measure, beam balance, flip charts, marker pens, real objects, and ruler	

Main competence	Specific competence	Learning Activities	Assessment Criteria	Suggested resources	Number of periods
	1.5 Demonstrate mastery of the methods for teaching and learning Mathematics outside the classroom.	Mastery of teaching and learning mathematics methods outside the classroom.	The management of out-of-class learning activities is appropriately demonstrated	Flip charts, marker pens, technology tools, manila cards, and various texts used to coordinate out-of-class teaching and learning activities	30

Bibliography

Ministry of Education and Culture (1995). *Education and training policy*. Ministry of Education and Culture

Ministry of Education and Culture (2009). *Curriculum and teaching syllabus for diploma in education*. Tanzania Institute of Education.

Ministry of Education and Vocational Training (2007). *Foundations of education syllabus for diploma in secondary education.*

Ministry of Education and Vocational Training.

Ministry of Education Vocational and Training (2014). *Education and training policy*. Ministry of Education Vocational and Training.

Moodley, P. (2015). *Student overload at university: large class teaching challenges: part 1*. South African Press.

Neary, M. (2002). *Curriculum studies in post-compulsory and adult education: A teacher's and student teacher's study guide.*

Nelson Thornes.

Taasisi ya Elimu Tanzania (2003). *Moduli ya somo la misingi ya elimu: Mafunzo ya ualimu ngazi ya cheti.* Taasisi ya Elimu Tanzania.

Tanzania Institute of Education (2013). *Module of curriculum and teaching diploma in secondary education curriculum.* Tanzania Institute of Education.

Tanzania Institute of Education (2013). *Module of curriculum and teaching diploma in secondary education curriculum*. Tanzania Institute of Education.

Tanzania Institute of Education (2015). *Guideline for evaluation of books*. Tanzania Institute of Education.

Wizara ya Elimu, Sayansi na Teknolojia (2014). *Sera ya elimu na mafunzo*. Wizara ya Elimu, Sayansi na Teknolojia.