The Republic of Uganda

Ministry of Education and Sports

MATHEMATICS TEACHING SYLLABUS

Uganda Certificate of Education

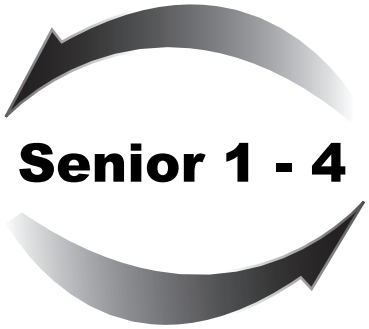
Senior 1 - 4

National Curriculum Development Centre
P.O. Box 7002
Kampala - Uganda

2008

MATHEMATICS TEACHING SYLLABUS

UGANDA CERTIFICATE OF EDUCATION



National Curriculum Development Centre

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The National Curriculum Development Centre (NCDC) takes responsibility for any shortcomings that might be identified in the publication and welcomes suggestions for effectively addressing the inadequacies.

Connie Kateeba
DIRECTOR,
National Curriculum Development Centre

FOREWORD

The educational experiences one goes through have a lot of bearing on the knowledge and skills acquired, attitudes developed and consequently what one is able to do in achieving quality and successful life.
The teaching syllabuses for O-Level subjects will go a long way in achieving the government aims and objectives of education for all. For a long time each school has been developing its own teaching syllabuses. However, there has been need to standardise the various teaching syllabuses, in terms of scope and depth of the content in the various subjects for every school. This will provide detailed guidance to the teacher for scheming and lesson preparations. The syllabuses still leave room for the teacher to use his/her own creativity. These standardised syllabuses will guide the teaching/ learning process.

I appeal to all stakeholders to join hands and make the implementation of this educational process a success.

Dr. John Mbabazi
Director of Education
Ministry of Education and Sports

SECTION I

INTRODUCTION

This teaching syllabus was developed as a result of merging two Mathematics syllabus, that is “alternative S and Alternative B”. The two alternatives were used in Uganda Secondary Schools after Uganda had established its own examination Board.

PURPOSE

The importance and use of Mathamtics in daily life need not to be over emphasised. The teachers,the major target of using the syllabus, have the challenge of bringing out or using examples of where Mathematics is used in the daily life of the learners. Teachers should not make the subject abstract instead the environment should be used while teaching.

BROAD AIMS OF EDUCATION

(i) To promote understanding and appreciation of the value of national unity, patriotism and cultural heritage, with due consideration of internal relations and beneficial inter-dependence;

(ii) To inculcate moral, ethical and spiritual values in the individual and to develop self-discipline, integrity, tolerance and human fellowship;

(iii) To inculcate a sense of service, duty and leadership for participation in civic, social and national affairs through group activities in educational institutions and the community;

(iv) To promote scientific, technical and cultural knowledge, skills and attitudes needed to promote development;

(v) To eradicate illiteracy and to equip the individual with basic skills and knowledge to exploit the environment for self-development as well as national development, for better health, nutrition and family life, and the capability for continued learning; and

(vi) To contribute to the building of an integrated, self-sustaining and independent national economy.

THE AIMS AND OBJECTIVES OF SECONDARY EDUCATION

(i) Instilling and promoting national unity and an understanding of social and civic responsibilities; strong love and care for others and respect for public property, as well as an appreciation of international relations and beneficial international co-operation.

(ii) Promoting an appreciation and understanding of the cultural heritage of Uganda including its languages;

(iii) Imparting and promoting a sense of self-discipline, ethical and spiritual values and personal and collective responsibility and initiative;

(iv) Enabling individuals to acquire and develop knowledge and an understanding of emerging needs of society and the economy;

(v) Providing up-to-date and comprehensive knowledge in theoretical and practical aspects of innovative production, modern management methods in the field of commerce and industry their application in the content of socio-economic development of Uganda;

(vi) Enabling individuals to develop basic scientific, technological, technical, agricultural and commercial skills required for self-employment;

(vii) Enabling individuals to develop personal skills of problem-solving, information gathering and interpretation, independent reading and writing, self-improvement through learning and develop of social, physical and leadership skills such as are obtained through games, sports, societies and clubs;

(viii) Laying the foundation for further education;

(ix) Enabling the individual to apply acquired skills in solving problems of the community, and to develop in him a strong sense of constructive and beneficial belonging to that community;

(x) Instilling positive attitudes towards productive work and strong respect for the dignity of labour and those who engage in productive labour activities.

AIMS OF TEACHING MATHEMATICS

The aims of teaching Mathematics include among others:

a) To develop an attitude of logical thought.

b) To enable the learner interprete and analyse everyday Mathematics related problems.
c) To present information in tabular and graphic form.
d) To prepare the learner for further training in Mathematical techniques.
e) To provide an understanding of basic Mathematical concepts.

The integration of subjects like Agriculture, surveying, Engineering, Physical Education, Graphic Art, Business Studies with Mathematics must be revealed to the learners. This also is the responsibility of the teacher. Similarly approximation and estimation should be part and parcel of the Mathematics lesson wherever applicable. In addition, it is strongly recommended that the routine use of mental work should be a priority in every Mathematics classroom. It should be noted that well drawn diagrams explain many Mathematical concepts better than words and the learner should be given a chance to draw diagrams as well as to interpret them. This is one way of ensuring that learners not only learn Mathematics but also do Mathematics.

TARGET

This syllabus is supposed to be used by grade V or graduate teachers of Mathematics.

SCOPE AND DEPTH

This teaching syllabus groups the various topics in such a way that the inherent structure within the subject is not lost to the learner. For convenience of use the syllabus is divided into four parts, one for each level of secondary school, i.e. S.1 to S.4.
S.1 has 21 topics, S.2 has 17 topics, S.3 has 16 topics and S.4 has 10 topics. The teaching syllabus also includes considerable detail about the various topics. It gives insight into the depth to which each topic should be taken and provides a basis for writing teaching materials.

TEACHING SEQUENCE

The teaching sequence is as follows from senior one through to senior four:
Senior One
Sets
Number Bases
Numerical Concepts II
Fractions and Percentages
Rectangular Cartesian Coordinates in 2 Dimensions
Locus

TEACHING SEQUENCE cont'd

Graph Plotting and Drawing
Algebraic Symbols
Geometric Construction Skills Training
Sequence and Number Patterns
Approximation and Estimation
Commercial and Household Arithmetic
Bearing
General and Angle Properties of Geometric Figures
Distance/ Time/Speed/Time Graph 1
Statistics 1
Algebra
Equations of Lines and Curves

Senior Two

Algebra : Use of Symbols, Substitution
Mappings and Relations
Numerical Concepts
Business Arithmetic
Vectors and Translation 1
Graphs II
Statistics
Indices and Logarithms
Inequalities and Regions
Algebra
Ration and Proportion
Similarities and Enlargement
The Circle
Rotation
Geometry Length and Area Properties
Geometry Nets and Solids
Numerical Concepts

Senior Three

Set Theory
The Equation of A Straight Line
Sine, Cosine and Tangent
Data Collection
Vectors
Proportion
Business Mathematics
Matrices
Probability
Algebraic Expressions, Equations and Inequalities
Quadratic Equations
Circles
Bearings
Areas and Volumes of Solids
Further Transformations
Simultaneous Equations

Senior Four

Matrices of Transformation
Composite Functions
Equations and Inequalities
Linear Programming
Algebra
Rate of Change
Area under a Graph
Extension of Trigonometry
Loci

TIME ALLOCATION

The time allocated to Mathematics is 6 periods of 40 minutes each per week.

HOW TO USE THE SYLLABUS

The teacher should think of various ways to enable the learners to experience Mathematics. Examples of the uses of each topic in this teaching syllabus can be brought out during the teaching /learning process. Some have been given in the syllabus while others will be thought of by each teacher as they arise.

Practical problem solving should be an everyday part of the Mathematics curriculum. Problems should be so chosen as to link the concepts and skills acquired in the Mathematics lessons with their applications in problem – situations that arise in the environment of the students. This not only gives the learner a chance to consolidate the new concepts and techniques that have been learned but also allows him or her to appreciate the power of the subjects as a tool to understand, interpret and control the environment.
Learners should be encouraged as much as possble, to work together in solving problems and conducting Mathematical investigations to become familiar with the processes in Mathematics. This will help to eradicate anxiety and promote co-operation within the class as a whole.

MODE OF ASSESSMENT

Learners should be assessed in Mathematics using continous assessment. This can be in the form of daily exercises, assignments, projects, home works, practicals and many other methods. With continous assessment, time will not be lost as the practise now in many schools where there is a schedule for doing examinations/tests, for example, beginning of term, mid term and end of term examinations.
Continous assessment marks should be reflected on learners report from S.1 term I upto S.4 term I. It is important that the teacher keeps the assessment records of each learner so as to monitor the learner's progress.

Summative assessment will be done at the end of S.4 by Uganda National Examination Board. The examination will be composed of two examinations paper each with two sections. Each paper will be 2 ½ hours.