Ministry of Education and Sports

TECHNICAL DRAWING TEACHING SYLLABUS

Uganda Certificate of Education

Senior 1 - 4

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

2008
TECHNICAL DRAWING TEACHING SYLLABUS

UGANDA CERTIFICATE OF EDUCATION

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Technical Drawing Teaching Syllabus, National Curriculum Development Centre.
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Gratitude goes to the Ministry of Education and Sports for supporting the writing of the different subject syllabi. Our thanks also go to partners in education who provided the professional information and advice that was put together to come up with this teaching syllabus. These include Secondary Schools, Universities, National Teacher Colleges, Uganda National Examinations Board (UNEB), Directorate of Education Standards (DES), Technical and Business Institutions, Private Organisations and Religious Organisations.

Last but not least we would like to acknowledge all those behind the scenes who formed part of the team that worked hard to finalise the work on the various syllabi.

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
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 is a teaching syllabus for Technical Drawing for senior 1-4 (ordinary level). The subject of Technical Drawing was introduced during the Missionary days and later the colonial and the post independence governments took it up. The subject started in City and Guild; it was designed by the Cambridge Overseas Examination Syndicate and revised by the East African Examination Council. For sometime, there has been no standard Technical Drawing teaching syllabus in Uganda. However, there has been teaching and learning of the subject. The syllabuses that were used differed from school to school and lacked many aspects of teaching syllabuses. This made their use difficult. The syllabus for teaching Technical Drawing has been produced with intention of making the content clearer to the teacher by defining the scope, depth and sequence in order to guide the teaching and learning process.

PURPOSE OF THE TEACHING SYLLABUS

There has been a general outcry from stakeholders about learners completing ordinary level, with hardly any practical skills. The Ugandan society wants education with a practical touch that combines cognitive and psychomotor domains. Yet schools offering Technical Drawing had no standard teaching syllabus. This made them fail to deliver what was expected of them. This teaching syllabus now guides the teacher to enable the learner to acquire the basic knowledge, skills, values and attitudes of geometry, graphics, working drawing and to develop an understanding of Technical Drawing to live a meaningful life there after. The learner who successfully completes this teaching syllabus is expected to be self employed and also work in Architectural Firms, Building Sites, Workshops, Garages, Cottage and Manufacturing industries among others.

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.
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 collective personal 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 individual to develop basic scientific, technological, technical, agriculture and commercial skills required for self-employment;

(vii) Enabling individuals to develop persona 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 TECHNICAL DRAWING

To enable the learner to:

• Acquire the basic principles of draughts person.
• Develop the basic skills of draughts person.
• Acquire graphical course required for studying engineering.
• Develop ability to transform orthographic to pictorial views and vice versa.
• Communicate effectively using graphics.
• Use acquired knowledge for solving day-to-day engineering problems.
• Read and interpret working drawing.

TARGET

The users of this teaching syllabus are professional teachers of Diploma or Graduate levels, who are expected to teach S.1 – S.4.

SCOPE AND DEPTH

The scope has been defined in the topics and their sub topics and depth in the content outline.

TEACHING SEQUENCE

<table>
<thead>
<tr>
<th>Plane</th>
<th>Plane and Solid Geometry</th>
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| S 1.  | 1.0 Introduction to Technical Drawing  
       | 2.0 Lines, angles, dimensioning and simple plane figures  
       | 3.0 Plane figures |
| S.2   | 4.0 Freehand sketching  
       | 5.0 Construction of Ellipse  
       | 6.0 Enlargement and reduction  
       | 7.0 Transformation of figures  
       | 8.0 Introduction to pictorial drawings  
       | 9.0 Orthographic projection of solids |
| S.3   | 10.0 Surface development  
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<pre><code>   | 12.0 Principles of cross – sectioning |
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<td>Plane Plane and Solid Geometry</td>
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<td>1.0 Parts of a Building</td>
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<td>S.IV</td>
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**TIME ALLOCATION**

The Technical Drawing shall have three periods every week in the first term, second and third term of every year of study. Each period will last for 40 minutes. Time allocation for each topic is given as a guide. The school is at liberty to improve on this time. It is assumed that, there are twelve weeks of teaching and learning in every term except third term of senior four.
HOW TO USE THIS TEACHING SYLLABUS

This syllabus guides the teacher on how to cover the entire syllabus. The topics have been structured from simple to complex areas of learning. The suggested teaching and learning strategies are not exhaustive. The teacher is encouraged to solicit further information from the references given, the Library, newspapers, Magazines, Internet, Catalogue and Resource Persons. Field visits to relevant areas of study like Architectural Firms, Building sites, Factories, Garages, and workshops are encouraged. Enough time has been left for revision in senior four so that the learner can discuss, internalize and prepare for the final examinations. The subject requires materials, tools and equipment. The list of these requirements is found in the appendix. In freehand sketching, drawing instruments are not allowed. However, the drawing should be proportional. It is recommended that this syllabus be used with the relevant text books of Technical Drawing, Teachers’ Guides and learners’ textbooks. Lastly, international conventions for Technical Drawing should be applied.

MODE OF ASSESSMENT

Assessment is finding out how much a learner has achieved during and after the teaching and learning process. Learners are assessed because of the following reasons:

- Identifying learners who need remedial work.
- Finding out how much the learner has achieved.
- Informing the learners on what they have achieved.
- Encouraging learners to perform better.
- Making new plans for effective teaching and learning.
- Measuring process from one topic another.
- Identifying learners who have exceptional talents for more challenging tasks.
- Providing required information to learners, administrators, parents, guardians and Ministry of Education.

This syllabus will be assessed in two ways.

Continuous Assessment
Continuous Assessment will start right from senior one all through to senior four term two, when candidates will be sitting for Mock Examinations. For purpose of final examination, results of senior three and senior four continuous assessment will be used for grading by UNEB. Continuous assessment is done in the normal periods of learning whenever a sub topic in completed. Since the subject is skill based, all the competences; oral, written and practical should be assessed by the teacher by recording marks, observing learners in the practical and examining work produced, among others. The competences achieved by the learner are recorded on a progressive chart, in a simple and cumulative way, using a checklist, which is displayed later, to check performance and work done in order to inspire and motive further learning. Regular reports should be given to the learners. Supervise teachers and give them materials to enable them to excel in their work.

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EXAMINATION FORMAT
There will be two papers and coursework assessment.

Paper 1:
Geometrical Drawing (Plane and Solid Geometry) (3 hours). It shall be compulsory for all candidates of Technical Drawing. The paper will consist of two sections A and B. Each section will have four questions. Candidates will be required to answer four questions with at least two questions from each section. (100 Marks)

Either option 1, Paper 2
Mechanical Drawing (3 hours). Paper 2 will consist of two compulsory questions. Question 1 will carry 20 marks. Question 2 will carry 60 marks (80 Marks)

Or option 2, Paper 3.
Building Drawing (3 hours). Paper 3 will consist of two compulsory questions.
Question 1 will carry 20 marks. Question 2 will carry 60 marks. (80 Marks)

Note: Candidates will offer either Paper 2 or Paper 3 but not both.

Coursework Assessment
For external examinations, coursework assessment will be done in paper two, Mechanical Drawing and paper three, Building Drawing. This will be based on candidate’s original work during the last two years of the course, in any of the following: Practical work, Coursework, Project, Assignments and Exercises. It will be marked by the subject teacher and an external examiner, should it becomes necessary. The teacher should keep the record of marks and the practical pieces to confirm the coursework marks sent to UNEB. (20 Marks)

The assessment should reflect testable competences in the following domains:

a) Knowledge; of terminology, facts, skills and principles of the subject.
Comprehension; the ability to explain the working drawing, translate working drawing to real products and use standard procedure to solve technical problems.
b) Application; the ability to interpret working drawing, make working drawing, apply rules and regulations to new situations and to approve working drawing.
c) Practical; the ability to use knowledge, materials, tools and equipment to produce articles, taking and reading measurement, presentation of cutting list and material list in standard form.

Note: Coursework marks should be submitted to UNEB by 31st October, of the year of Examination. Candidates whose Course work marks are not submitted will not be graded.