



education

Department of Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL CURRICULUM STATEMENT
GRADES 10-12**

**SUBJECT:
ENGINEERING GRAPHICS AND DESIGN**

**TEACHER TRAINING MANUAL
2006**

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PROGRAMME

PERIOD: Monday to Friday

DURATION: 36-37 hours

5-DAY PROGRAMME FOR TEACHERS-

SESSION	ACTIVITY	TIME	DAY
1. Introducing the National Curriculum Statement (NCS) and the National Senior Certificate (NSC)	Introduction of training participants	3-4 hours	Mon AM
	Overview of the week of training / documents provided		
	Introduction to the NCS and NSC		
2. Introducing the Subject Statement	Introduction : Overview	20 hours	Mon PM – Wed PM
	What is new? Audit Content and competencies Integration of Learning Outcomes and Assessment Standards		
	What SKVs are imparted? Implications for Teaching and Learning Implications for Assessment Designing EGD questions		
	Conclusion / Wrap-up		
3. Planning for teaching subjects in the NCS	The Planning Cycle	8 hours	Thu
	The Grade 11 Work Schedule		
	Critique of the Grade 11 Work Schedule		
	Development of the first Lesson Plan for Grade 11		
4. Annual assessment plan	Introduction	5 hours	Fri AM
	Annual assessment plan		
	Conclusion / Wrap-up		

**SESSION 1 –
Introducing the National Curriculum Statement (NCS) and the National Senior
Certificate (NSC) (3-4 hours)**

ACTIVITY 1: Introduction of training participants

FORM OF ACTIVITY: Introductions

ACTIVITY 2: Overview of the week of training / documents provided

FORM OF ACTIVITY: Presentation

RESOURCES: The 5-day training programme (PowerPoint)
A hard copy of each document referred to-

- National Senior Certificate Policy
- Subject Statement
- Subject Assessment Guidelines
- Learning Programme Guidelines
- Teacher Guide – only applicable to Mathematical Literacy and Life Orientation
- National Protocol on Assessment
- Higher Education admission requirements

CONTENT:

- Training programme for the week and house rules
- Documents making up the National Curriculum Statement policy and documents supporting the National Curriculum Statement policy – purpose and status of each

ACTIVITY 3: Introduction to the NCS and NSC

Part 1: 20 Questions

FORM OF ACTIVITY: Test and discussion

RESOURCES: PowerPoint Presentation, Laptop, and Data Projector

CONTENT:

20 questions focusing on the NCS and NSC

INSTRUCTIONS:

- Participants must record their responses to each question as individuals.
- The answers will be discussed with the group as a whole, inviting participants to offer answers before discussing them.

Part 2: NCS and NSC

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, a hard copy of each document referred to in the presentation-

- National Senior Certificate Policy
- Subject Statement
- Subject Assessment Guidelines
- Learning Programme Guidelines
- National Protocol on Assessment

CONTENT:

- Overview of the NCS, including principles and Critical and Developmental Outcomes
- National Senior Certificate: Requirements, structure and details

Part 3: Requirements for Higher Education study

FORM OF ACTIVITY: Open-book and presentation

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, HE admission requirements

CONTENT:

- Requirements for certificate, diploma and degree programmes

INSTRUCTIONS:

Introduction

- While the Higher Education document is not part of NCS policy, it provides teachers with indicators on required learner performance in NCS subjects for entry into Higher Education
- The 3-year NSC programme is the key to Higher Education study and teachers need to be aware of the admission requirements for different programmes offered at Higher Education Institutions

Open-book activity

- Ask participants to study the HE document and identify the requirements for certificate, diploma and degree programmes

Report back and discussion

- Allow one report back
- Present the requirements (see PowerPoint Presentation)
- Discuss the designated list of subjects, noting that learners already have 3 of the designated subjects in their NSC package – two languages and Mathematics or Mathematical Literacy

**SESSION 2 –
Introducing the Subject Statement (20 hours)**

Activity 1	Overview of ENGINEERING GRAPHICS AND DESIGN : Integration across learning outcomes
ENGAGEMENT:	Power Point Presentation
TIME ALLOCATION:	60 minutes
RESOURCES:	PowerPoint Presentation, Laptop, Data Projector, Subject Statement, a hard copy of each policy supporting documents including a document on HIV / Aids

INTRODUCTION:

- Overview of the subject: Definition, purpose and scope of the subject – its origin
- Learning Outcomes for the subject
- Mention of supporting policies relevant to the subject and how they support the implementation of the subject Engineering Graphics and Design (do not engage in them)
- Time allocation and placement of **ENGINEERING GRAPHICS AND DESIGN** in the school timetable. To be discussed in the activity on **IMPLICATIONS FOR LEARNING, TEACHING AND ASSESSMENT**.

CONTENT:

Subject content and approach to teaching, learning and assessing

ENGAGEMENT:

- Do a critical study of the Grade 10-12 subject content for **ENGINEERING GRAPHICS AND DESIGN** as provided for the Learning Outcome in the Subject Statement (Chapter 3) and Learning Programme Guidelines (Appendix B of LPG)
- What content is new – i.e. which is unknown to you? (see **ACTIVITY 2**)
- What content and competencies are to be taught per grade for the Learning Outcome? (see **ACTIVITY 3**)
- Is progression evident within the Learning Outcome across the three grades? Provide examples of such progression.
- Is there a link between the content indicated for each Assessment Standard? (i.e. What integration is possible within the Learning Outcome?) (see **ACTIVITY 4**)
- What must a learner be able to know, do and value after exposure to the content in this Learning Outcome? (i.e. skills, knowledge and values) (see **ACTIVITY 5**)

Activity 2	What content is new – i.e. which is unknown to you? (Knowledge gaps: ENGINEERING GRAPHICS AND DESIGN Grades 10, 11 and 12)
ENGAGEMENT:	Participants will identify any knowledge and skills gaps within the subject which they might have and for which they need further training.
TIME ALLOCATION:	2 hours
RESOURCES:	Check list

INSTRUCTIONS:

- The facilitator will hands out a checklist which includes suggested content and context to achieve the LO's of ENGINEERING GRAPHICS AND DESIGN
- The aim of the checklist is to identify any knowledge and skills gaps within the subject which you might have and for which you need further training.
- Each participant must complete the checklist.
- The checklist can be used as a guideline to determine skills and knowledge gaps within a province.

CHECKLIST-

The aim of this checklist is to identify any problem areas within the subject specifics which you might have and for which you need further training.

Self-Evaluation (Behavioural Outcomes):

How good are you at creating an environment conducive for learning?

Rate yourself (as honestly as possible) for your personal development against the observable behaviours in the table below. Mark the column that represents your **current** level of competence:

The following indicators apply:

- O = Outstanding:** significantly above requirements for successful task performance.
- E = Excellent:** exceed requirements for successful task performance.
- S = Satisfactory:** meets requirements for successful task performance.
- M = Marginal:** below requirements for successful task performance.
- U = Unsatisfactory:** significantly below requirements for successful task performance.

Content	O	E	S	M	U
1. Introduction to EGD <ul style="list-style-type: none"> • Scope • HIV/Aids Issues • Relevant legislation 					
2. Drawing principals <ul style="list-style-type: none"> • SANS code of practice (0111 & 0143) • Types of lines and general lettering requirements • Setting up drawing sheet • Paper sizes 					
3. Freehand Drawing					
4. Instrument Drawing					
5. Orthographic Projection <ul style="list-style-type: none"> • 1st and 3rd angle 					
6. Descriptive Geometry <ul style="list-style-type: none"> • points and lines • true length of true angle 					
7. Solid Geometry <ul style="list-style-type: none"> • Construction of polygons • Orthographic views of: Prisms, pyramids, cones and cylinders • Axis: perpendicular, parallel or inclined • Composite solids 					
8. Civil Drawing <ul style="list-style-type: none"> • Annotation, dimensioning, scale • Floor plans • Elevations • Sectional elevations • Foundation to slab • Foundation to ceiling • Foundation to roof • Colour coding • Site plan • Schedule of specs including electrical, plumbing, drainage 					
9. Electrical Drawing <ul style="list-style-type: none"> • Knowledge of symbols • Draw simple circuit diagrams • Draw parallel and series circuit diagrams including house wiring • Draw wiring diagrams on floor plans 					
10. Mechanical Drawing <ul style="list-style-type: none"> • Draw simple castings including fasteners • Outside and sectional views of simple assemblies • Outside and sectional views of complex assemblies • Welding, machining and surface treatments symbols 					

Content	O	E	S	M	U
11. Interpenetrations <ul style="list-style-type: none"> line of interpenetration when objects, profiles or solids penetrate or join industrial applications: hoppers, transition pieces etc. 					
12. Developments <ul style="list-style-type: none"> Surface development of industrial examples: pipes, hoppers etc. 					
13. Pictorial Drawings <ul style="list-style-type: none"> Oblique Isometric Single and Double point perspective 					
14. Loci <ul style="list-style-type: none"> Helix (single Start) Cams (wedge and roller) 					
15. Sectioning Orthographic views of: <ul style="list-style-type: none"> Geometrical solids Objects from industry True shapes Dwellings (foundation to slab, ceiling, roof) 					
16. Computer Technology <ul style="list-style-type: none"> List electronic and computer technologies Evaluate advantages, disadvantages of above on EGD 					
17. CAD <ul style="list-style-type: none"> Hardware, operating systems, file types and file management CAD software: Product: _____ Draw and modify functions 3 axis drawings 					
18. Design Process <ul style="list-style-type: none"> Identify, analyse, synthesise, working drawings, model making and evaluation Applied on Civil, Electrical and Mechanical technologies 					

What are you really good at?

What problems do you experience?

Name: _____ School: _____

Signature: _____ District: _____

Date: _____

Activity 3	Content and Competencies Taught per Learning Outcome and per Grade
<p>ENGAGEMENT:</p> <p>TIME ALLOCATION:</p> <p>RESOURCES:</p>	<p>Identify and analyse content, context and competencies imbedded in the LOs and ASs for ENGINEERING GRAPHICS AND DESIGN.</p> <p>2.5 hours</p> <p>Worksheet and flip chart. Subject Statement and Learning Programme Guidelines for ENGINEERING GRAPHICS AND DESIGN.</p>

INSTRUCTIONS:

- Use the worksheet below to complete the task.
- The content and competencies in one Assessment Standard is given in the example.
- Reproduce the table on a flip chart showing all the Assessment Standards for each of the Learning Outcomes.
- Identify and analyse the content, context and competencies implied by the LOs and ASs in Engineering Graphics and Design for Grades 10, 11 and 12.
- Participants to work in pairs.
- Use your completed table and examine it for progression which is evident within the Learning Outcome across the three grades? Provide examples of such progression. Write this down in your manual.
- Participants will report back as indicated by the facilitator.
- Allow each presenter approximately 5 minutes to give his/her presentation to the plenary.
- Facilitator will allow comments/questions from the other groups.

ACTIVITY 3: WORKSHEET

LO 1: Technology, Society and the Environment	LO 2: Design Process	LO 3: Knowledge and understanding	LO 4: Application of knowledge
Identify the key words/noun in the AS that provides content for the lesson			
Identify the verb in the AS which will generate the evidence (competency)			
<u>Example:</u> AS: 1 Content: Environmental technology Competency: Gr. 10: Describe Gr. 11: Discuss and Analyse Gr. 12: Evaluate	AS: Content: Competency: Gr. 10: Gr. 11: Gr. 12:	AS: Content: Competency: Gr. 10: Gr. 11: Gr. 12:	AS: Content: Competency: Gr. 10: Gr. 11: Gr. 12:

WRAP-UP:

- How and why do we use the Assessment Standards in the design and delivery of my lesson? (Verb: evidence learner generates, Noun refers to the content of the lesson). Assessment Standards also refer to how much evidence and what level they have to be produced.

Activity 4	The Integration of Learning Outcomes and Assessment Standards Within ENGINEERING GRAPHICS AND DESIGN	
ENGAGEMENT:	4.1	Demonstrate an understanding of the integration of LOs and ASs within ENGINEERING GRAPHICS AND DESIGN.
	4.2	Demonstrate an understanding of the integration of LOs and ASs of ENGINEERING GRAPHICS AND DESIGN with other Technology subjects.
TIME ALLOCATION:	120 minutes	
RECOURSES:	NCS, LPG and worksheets, flip chart, Koki pens PowerPoint presentation	
METHOD (S):	Presentation, working in pairs	

INTRODUCTION:

- Facilitator introduces the activity – Two-point perspective
- Explain the concept of integration within a Learning Outcome and across Learning Outcomes.
- Explain the concept of the integration of ENGINEERING GRAPHICS AND DESIGN with other subjects

INSTRUCTIONS:

- Participants work in pairs.
- Consider all the AS's and identify which AS's can be linked in developing an assessment task.
- Use a pen/pencil to draw lines to link the appropriate AS's.
- Use the flip chart and replicate the table. Write under each Learning Outcome the relevant Assessment Standard code (number) and indicate the links using the koki pen.
- Pairs will report back indicating the possible linkages, and giving an example of a possible assessment task.

LO 1	LO 2	LO 3	LO 4
Technology, Society and the Environment	Design Process	Knowledge and understanding (Demonstrate)	Application of knowledge (able to, apply)
11.1.1 discuss and evaluate the interrelationship between EGD, society and the environment	11.2.1 identify a problem, need or opportunity by interpreting given information and formulating	11.3.1 various codes of practice related to advanced civil, electrical and mechanical drawing	11.4.1 advanced visualisation, cognitive and interpretation of information and drawings
11.1.2 formulate strategies that show sensitivity to a broad spectrum of human rights issues	11.2.2 conduct relevant research/case studies and generate a number of ideas/concepts analytically and graphically	11.3.2 principals of projection with respect to advanced multi-view and pictorial drawings	11.4.2 measuring, dimensioning, printing, annotations, constructions, projections to produce advanced freehand, instrument CAD drawings
11.1.3 identify and suggest strategies for safe practices in an EGD that safeguard against the contact/spread of Aids	11.2.3 select the most relevant possibility giving reasons for choice based on manufacturing techniques, analyse it, and synthesize it into a final solution	11.3.3 theory related to computer hardware and relevant functions of CAD software	11.4.3 single and multi-view projections to produce drawings of : Advanced 1 st , 3 rd angle orthographic views Descry. Geometry and Geom. Solids <ul style="list-style-type: none"> • Interpenetrations • Development • Advanced loci • Circuit diagrams • Dwellings • Assemblies • Surface textures
11.1.4 Compare contributions made by Global Cultures to graphical communication	11.2.4 present the final solution using graphics including visual, symbolic and language skills in appropriate modes	11.3.4 advanced design principals	11.4.4 pictorial drawings: Isometric perspective
		11.3.5 techniques used to produce advanced freehand, instrument and computer drawings	
11.1.5 discuss the competencies required by entrepreneurs	11.2.5 show evidence of evaluation at each stage of design process	11.3.6 principals of advanced loci, assemblies, sectional views and detail drawings	
		11.3.7 methods of graphical communication and presentation	

WRAP-UP:

Is integration recommended?

Is it only the Assessment Standards that can be integrated?

Suggest ways in which EGD can be integrated with other technology subjects.

What determines the integration of the Assessment Standards?

What is learner performance recorded against?

Will clustering of AS's be the same for planning an assessment task?

Activity 5	What Must The Learner Know, Can Do And Value After Exposure To The Content In The Learning Outcomes
ENGAGEMENT:	Participants will read the LO and unpack the SKV's that may be imbedded in the Learning Outcomes (LO1 & LO3 or LO2 & LO4). Participants will write their answers on a flip chart for reporting back.
TIME ALLOCATION:	120 minutes
RESOURCES:	Worksheet, Flip chart, koki pens NCS and LPG for ENGINEERING GRAPHICS AND DESIGN
BACKGROUND READING:	Subject Statement and Learning Programme Guideline for ENGINEERING GRAPHICS AND DESIGN.

INTRODUCTION:

- State the outcome for this activity, elaborating where necessary.
- Contextualise – Make participants aware of the fact that in order to develop a Learning Program participants should be well acquainted with the LO's of ENGINEERING GRAPHICS AND DESIGN
- Explain the concepts Knowledge, Skills and Values.

INSTRUCTIONS:

- Assign LOs to each group. (LO1 & LO3 or LO2 & LO4).
- Read the LO and unpack the SKVs that may be imbedded in the Learning Outcome.
- Groups who were assigned to Learning Outcome 1 & 3 are required to find the links to Assessment Standards of Learning Outcome 1.
- Groups who were assigned to Learning Outcome 2 & 4 are required to find the links to Assessment Standards of Learning Outcome 2.
- Write the observations on a flip chart for reporting back.
- Groups to report to back.

Worksheet: LO 1 and LO 3 – to be completed

Assessment standard (Can do)	Content (knowledge) Learning Outcome 3	Link to AS of Learning Outcome 1 (Values)
<p>(EXAMPLE) 11.3.1 varoius codes of practice related to advanced civil, electrical and mechanical drawing</p>	<p>Drawing principals as contained in SANS code of Practice as related to advanced Electrical, Civil and Mechanical drawings</p>	<p>11.1.4</p>
<p>11.3.2</p>	<p>Single and multi-view drawing principals : 1st, 3rd Angle orthographic projection interpenetrations development circuit diagrams simple assemblies detail drawings dwellings</p>	
<p>11.3.3</p>	<p>11.3.8 Terminology, concepts as functions of CAD</p>	
<p>11.3.4</p>	<p>11.3.7 Principles of design</p>	
<p>11.3.5</p>	<p>11.3.2 Advanced freehand, instrument and CAD</p>	
<p>11.3.6</p>	<p>11.3.6 Loci of points 11.3.5 Multi-view drawings</p>	
<p>11.3.7</p>		

Worksheet: LO 2 and LO 4 – to be completed

Assessment standard	Content (Knowledge) Learning Outcome 4	Link to AS of Learning Outcome 2 (Skills)
<i>(EXAMPLE)</i> 11.4.1		
11.4.2		
11.4.3		
11.4.4		

WRAP-UP:

- Highlight all the main content issues.
- Use any further issues that arose during the engagement and consolidation process to inform what you highlight.

Activity 6	IMPLICATIONS FOR TEACHING AND LEARNING
ENGAGEMENT:	Participants will demonstrate an understanding of the new approach to teaching and learning
TIME ALLOCATION:	2.5 hours
RESOURCES:	Worksheet, Flip chart, Koki pens, Prestik NCS and LPG for EGD
BACKGROUND READING:	Subject Statement and Learning Programme Guidelines for EGD.

INTRODUCTION:

- What kind of teaching, learning and assessment approach is required to teach, learn and assess the content (i.e. skills, knowledge and values) indicated in Activity 5.
- What LTSM is required to teach the content imbedded in the Learning Outcomes to achieve the skills, knowledge and values indicated by the Assessment Standards?
- Engage the participants in subject activities for ENGINEERING GRAPHICS AND DESIGN which they critique: Does each of the activities address the Assessment Standards of Learning Outcome with respect to the skills, knowledge and values that will be acquired through exposure to the activity?
- Input on assessment: How, when, who and what to assess in this activity – also make suggestions of the tools that can be used to assess learner performance in the activity and who should carry out the assessment

INSTRUCTIONS:

- Each group must choose three topics from the content for EGD.
- The worksheets to be completed require participants to suggest “why” and “how” the knowledge/skills will be taught with in the new approach to teaching and learning.
- Appoint a scribe to write the answers on a flip chart for reporting back.

WORKSHEET: Activity 6

	Grade 10	Grade 11	Grade 12
(EXAMPLE) What Content / Concepts	10.1 Pictorial Drawing : Isometric	11.1 Pictorial Drawing : Isometric	12.1 Pictorial Drawing : Isometric
Why context	<ul style="list-style-type: none"> • Learners must be able to interpret three dimensional objects • Visualisation • Must be able to produce 3D drawings from 2D views 		
How	<ul style="list-style-type: none"> • Start with 2D views and project them on to a box on the isometric axis • Using models 		

PRESENTATION	LTSM REQUIRED FOR EGD
ENGAGEMENT:	Discussion
TIME ALLOCATION:	60 minutes
RESOURCES:	Guidelines for selecting LTSM, Power Point presentation
BACKGROUND READING:	None

GUIDING CRITERIA FOR SELECTING TEXTBOOKS

1	CONTENT / CONTEXT
1.1	The textbook covers all the Learning Outcomes and the Assessment Standards of the subject.
1.2	The textbook covers the suggested content and this is appropriately sequenced.
1.3	The content is suitably paced and the weighting of LOs is appropriate.
1.4	The content is current and up-to-date.
1.5	The content places learning in context i.e. integrates Assessment Standards within the subject to give learners an authentic learning experience.
1.6	There is clear integration of theory and applied competence.
1.7	The content is sensitive to diversity e.g. culture, religion, gender, etc.
1.8	The textbook provides a variety of meaningful activities for individuals, pairs and groups.
1.9	The level of the content is appropriate for the specific grade.
1.10	The language used and vocabulary are appropriate for the grade and language level.
1.11	Key concepts and terms are clearly defined.
1.12	The language and vocabulary are correct and appropriate for the subject.

2	LEARNING ACTIVITIES & ASSESSMENT
2.1	Learning activities and assessment tasks are derived from LO's and AS's.
2.2	The textbook presents the learner with assessment activities appropriate to the subject.
2.3	Assessment tasks are aligned to the Programme of Assessment as described in the Subject Assessment Guidelines.
2.4	A variety of learning activities and assessment tasks are used.
2.5	Assessment targets learner achievement at different levels of complexity.
2.6	Assessment tasks are clearly formulated and unambiguous.
2.7	Assessment tasks and learning activities provide for daily assessment.
2.8	Assessment tasks allow for expanded opportunities for learners.
2.9	Assessment activities reflect the integration of Assessment Standards.

3	LAYOUT, DESIGN AND OVERALL QUALITY
3.1	The text is structured, using headings and subheadings.
3.2	The font and typeface are clear and easy to read.
3.3	The illustrations and diagrams are clear and relevant, without bias.
3.4	The paper is of a good quality and bound securely ¹ .
3.5	The textbook has an index with clear reference to chapters and page numbers.

4	TEACHER GUIDE
4.1	Provides clear and systematic guidance on the use of the textbook.
4.2	Provides examples of a subject framework and a work schedule.
4.3	Includes an exemplar assessment plan for the grade.
4.4	Provides memoranda, check lists, rubrics, etc. that match the assessment tasks in the textbook.
4.5	Provides suggested answers / solutions / memoranda / rubrics for learning activities / exercises.

5	EGD
5.1	Drawings, symbols, measurements, layout are according to the SANS standards.
5.2	The material includes practical examples in the built environment.
5.3	Material includes the latest relevant technologies.
5.4	Illustrations and diagrams have sufficient captions to enable learners to answer questions.

6	OTHER LTSM
6.1	Wall charts e.g. safety, roof truss designs, tools, materials etc
6.2	Videos, digital photo's e.g. construction processes
6.3	Scaled models e.g. roof trusses, placing of doors and windows etc
6.4	Examples of best practice (learner's work etc)
6.5	
6.6	
6.7	
6.8	
6.9	

Activity 7	IMPLICATIONS FOR ASSESSMENT
ENGAGEMENT:	Participants will demonstrate an understanding of the new approach to assessment in EGD.
TIME ALLOCATION:	120 minutes
RESOURCES:	Worksheet, Flip chart, Koki pens, Prestik NCS and LPG for EGD
BACKGROUND READING:	Subject Statement, Learning Programme Guidelines and Assessment Guidelines for EGD

INTRODUCTION:

- Facilitator provides each participant with a sheet of A4 paper.
- The activity must be done individually.

ENGAGEMENT:

- Facilitator asks participants to do a drawing of a house.
- Participants are required to work alone, within a time limit of five minutes, as this is a “test”.
- Participants display their posters to the rest of the group.
- Participants suggest a mark for each other’s efforts.
- Facilitator selects three random posters and assigns a mark to each of these.

STEP 7.1: MARKING THE “DRAWING A HOUSE” TASK

- If the house is a double storey, you get 5 points
- If your house is three dimensional you get, 5 points
- If your house has a garage, you get 5 points
- If your house has a fence, you get 3 points
- If you have a garden right around the house ,you get 2 points

Total=20 points

STEP 7.2: WRAP UP

- Participants indicate by a show of hands that got all 20 points.
- Ask participants what are the reasons for their not getting full marks.

The following principles underpin outcomes based assessment:

- Be understood by the learner and by the broader public
- Be clearly focused
- Be integrated with teaching and learning
- Be based on pre-set criteria
- Use a variety of instruments
- Use a variety of methods
- Allow for expanded opportunities for learners
- Be learner-paced and fair
- Be flexible.

STEP 7.3: INTRODUCTION TO ACTIVITY

- Participants remain in their respective groups.
- Refers to the task sheet in this activity.

STEP 7.4: MATCHING TERMS

- Individually, participants will match terminology in column A with the corresponding explanations in column B.
- Within their groups, participants share answers in order to develop one correct set of answers for the group.
- Groups discuss when it is most appropriate to use each of the methods of assessment, i.e. who is carrying out the assessment?

	COLUMN A	COLUMN B
WHY	1.Types of assessment	a Assignment, aural test, case study, examinations, multiple response questions,demonstrations,role-plays,poster,research,investigation, experiment, survey, project, model.
WHO	2.Methods of assessment i.e. who is carrying out the assessment	b Learning outcomes and assessment standards
	3.Methods of collecting evidence.	c Rubrics, rating scale, checklists, observation sheets, marking memoranda, assessment grids, etc.
WHAT	4.Assessment instruments	d Teacher assessment, self-assessment, test-based assessment, task-based assessment
HOW	5.Tools for assessing learner Performance	e Formative assessment; summative assessment, baseline assessment, diagnostic assessment
WHEN & WHERE	6.Recording tools	f Criteria and reference
FOR WHOM	7.Reporting tools	g Observation-based assessment, test-based assessment task-based assessment (product, process, performance)
		h Reporting cards using competence descriptions, teacher-parent interview, teacher-learner interview, written comments in learner workbooks, etc
		i Class list, mark sheet, promotion schedule

STEP 7.5: WRAP UP

The de-briefing could include the following questions:

- What type of assessment did this activity focus on?
- What assessment instrument did we use?

CHECKLIST TO BE USED WHEN PLANNING FOR ASSESSMENT

NO	ASPECT TO BE CONSIDERED	YES	NO	COMMENT
1	Is the purpose of assessment clear?			
2	Are the criteria to be used to assess performance indicated?			
3	Does the activity allow the learners to engage with the learning outcome(s)?			
4	Does the activity provide for different levels of learner performance?			
5	What methods of assessment are used?			
6	Are the methods used appropriate?			
7	Are the learners involved in the assessment?			
8	Are the results to be recorded?			
9	Is the tool for assessing learners' performance designed effectively?			
10	Is it clear how the result is to be used?			
11	Have all the assessment principles been addressed?			

Activity 8	DESIGNING EGD QUESTIONS
ENGAGEMENT:	Participants will demonstrate an understanding of FORMULATING NEW questions for assessment in EGD.
TIME ALLOCATION:	3 hours
RESOURCES:	Worksheet, Flip chart, Koki pens, Prestik NCS and LPG for EGD Previous Technical Drawing exam papers.
BACKGROUND READING:	Subject Statement, Learning Programme Guidelines and Assessment Guidelines for EGD

A critical review of past examination questions based on Report 550 with the view of converting them to questions suitable for assessing learner performance in a technology context.

CONTENT:

- A shift from Technical Subjects to Technology

INSTRUCTIONS:

- Study past examination questions papers based on Report 550 and convert them to suit ENGINEERING GRAPHICS AND DESIGN context.
- Ensure that the questions are linked to the Assessment Standards. Indicate how these questions can be used for teaching, learning and assessment purposes.
- Indicate how these questions have integrated content from different Learning Outcomes and Assessment Standards

SESSION 3 – Planning for teaching subjects in the NCS (8 hours)

ACTIVITY 1: Introduction to the planning cycle (½ hour)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, and Data Projector

CONTENT:

- Three stages of planning
- Purpose, role-players and duration per stage
- Issues to consider when developing a Learning Programme
- Brief overview of the key activities and development process per stage

ACTIVITY 2: Introduction to the Grade 11 Work Schedule (1 hour)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: OHP of Grade 11 Work Schedule, OHP Projector, OHP Pens, OHP Sheets, Subject Assessment Guidelines, Learning Programme Guidelines, and Subject Statement

CONTENT:

- Elements of design
- Process of design
 - Integration: What, how and why?
 - Sequencing: What, how and why?
 - Pacing: What, how and why?
 - Suggested assessment tasks: What and why? – will return to this in Session 4
 - LTSM: What and why?

ACTIVITY 3: Critique the Grade 11 Work Schedule (4½ hours)

FORM OF ACTIVITY: Interactive, report back and discussion

RESOURCES: Grade 11 Work Schedule (Appendix B of the LPG), Subject Statement, Learning Programme Guidelines, and Subject Assessment Guidelines

CONTENT:

Grade 11 Work Schedule

INSTRUCTIONS:

Participants study the example of the Grade 11 Work Schedule provided in the LPG and critique it:

- Does the Work Schedule cover all the Assessment Standards (i.e. content)?
- Integration: Are the Assessment Standards appropriately linked?
- Are the Assessment Standards covered in sufficient detail and depth?
- Pacing: Is the time allocation across the 40 weeks appropriate?
- Sequencing: Is the content presented in the correct order?
- Are relevant LTSM listed? If not, list the LTSM required.
- How can the Work Schedule be improved?

ACTIVITY 4: Report back (1 hour)

FORM OF ACTIVITY: Report back and discussion

RESOURCES: Subject Statement, Learning Programme Guidelines

CONTENT:

Improved Grade 11 Work Schedule

INSTRUCTIONS:

- Different groups to present their improved version of the exemplar Work Schedule for Grade 11.
- Discussion can be held after each presentation.

ACTIVITY 5: Development of the first Lesson Plan for Grade 11 (1 hour)

FORM OF ACTIVITY: Presentation, interactive, report back and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, Subject Statement, and Learning Programme Guidelines

CONTENT:

Grade 11 Lesson Plan

- Elements of design
- Process of design

INTRODUCTION:

- Lesson Plan: What it is and its duration
- Pointers on deciding on the number of Lesson Plans to be written
- Elements and design of a Lesson Plan
- Teaching method: What and why
- Assessment strategy: Who, when, how and form of assessment
- Expanded opportunities: Inclusive approach to accommodate all learners

INSTRUCTIONS:

- Provide an overview of the elements and the design process of a Lesson Plan.
- Engage in the development of the first Lesson Plan that will be presented for the first 2-5 weeks of the school year according to the Grade 11 Work Schedule critiqued in Activity 3 (Worksheet 1).
- Allow one group to present and then discuss their presentation.

SESSION 4 – Annual assessment plan (8 hours)

ACTIVITY 1: Introduction to assessment in the NCS (¼ hour)

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, and National Protocol on Assessment

CONTENT:

- Approach to assessment: Criteria-driven
- Recording process: Record one global mark / code per task and refer to the Subject Assessment Guidelines for guidance on how to arrive at the final mark for the subject
- Reporting process: 7 codes and percentages
- Portfolios: Teacher and learner

ACTIVITY 2: Programme of Assessment for Grades 10 and 11

FORM OF ACTIVITY: Presentation and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, and Subject Assessment Guidelines

CONTENT:

- Programme of Assessment for Grades 10 and 11 (Section 2 of the Subject Assessment Guidelines): Number of tasks
- Nature of tasks: Forms of assessment suitable to the subject (Section 3 of the Subject Assessment Guidelines) and suitable tools
- PAT
- Weighting of tasks for the formal Programme of Assessment and mark allocation

ACTIVITY 3: Development of a Grade 11 annual assessment plan

FORM OF ACTIVITY: Presentation, interactive and discussion

RESOURCES: PowerPoint Presentation, Laptop, Data Projector, and Subject Assessment Guidelines, Annual assessment Plan Gr. 11, Worksheet 2

CONTENT:

- Programme of Assessment for Grade 11: Tasks, topics, tools and dates

Part 1

INSTRUCTIONS:

- Engage in the compilation of a Grade 11 annual assessment plan in which you indicate:
 - Seven tasks: 2 Tests, 2 exams, 2 other tasks and PAT
 - Topics for each task
 - Assessment tools for each task
 - Date and duration of each task

- Revisit the Grade 11 Work Schedule (Session 3: Activity 3) and align the annual assessment plan for Grade 11 with the assessment tasks listed in the Work Schedule.

Part 2

PERFORMANCE ASSESSMENT TASK:

INSTRUCTIONS:

- Provide an overview of the PAT Task as per the Subject Assessment Guidelines for ENGINEERING GRAPHICS AND DESIGN and its role in ensuring the teaching, learning and assessment of the outcome (LO2)
- Examine and critique the PAT Task along with the example of an assessment tool:
- Do the task and its related activities address the Assessment Standards of Learning Outcome 2?
- Input on assessment: How, when, who and what to assess in this task – also make suggestions of other tools that can be used to assess learner performance in the activity and who should carry out the assessment.
- Make suggestions for improvements on the PAT Task

WORKSHEET 1

**SESSION 3 – ACTIVITY 5
FIRST GRADE 11 LESSON PLAN**

SUBJECT: ENGINEERING GRAPHICS AND DESIGN LESSON PLAN: 1 DURATION: 12 hours	GRADE: 11 NO. OF ACTIVITIES: WEEK / DATE: Weeks 1-6
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CONTEXT:	
LINK WITH PREVIOUS LESSON: ENGINEERING GRAPHICS AND DESIGN	LINK WITH NEXT LESSON:

CORE CONTENT (KSVs):
Replace!

	ACTIVITY 1	ACTIVITY 2	ACTIVITY 3	Etc.
LOs & ASs:				
CORE CONTENT:				
DETAIL OF ACTIVITY:				
TEACHING METHOD:				
ASSESSMENT STRATEGY:				
EXPANDED OPPORTUNITIES:				
RESOURCES:				
TEACHER REFLECTION:				

WORKSHEET 2

**SESSION 4 - ACTIVITY 3
ANNUAL ASSESSMENT PLAN FOR GRADE 11**

SUBJECT: ENGINEERING GRAPHICS AND DESIGN

GRADE: 11

YEAR: 2007

TERM 1	TERM 2	TERM 3	TERM 4
TASK 1	TASK 3	TASK 5	TASK 7
LO(s) and Topic: Form: Date: Duration: Tool:	LO(s) and Topic: Form: Date: Duration: Tool:	LO(s) and Topic: Form: Date: Duration: Tool:	LO(s) and Topic: Form: Date: Duration: Tool:
TASK 2	TASK 4		
LO(s) and Topic: Form: Date: Duration: Tool:	LO(s) and Topic: Form: Date: Duration: Tool:		
TASK 6: Practical Assessment Task			
LO(s) and Topic: Date: Duration: Tool(s):			