

A summary of all the changes to the
NATED Business and Engineering curricula

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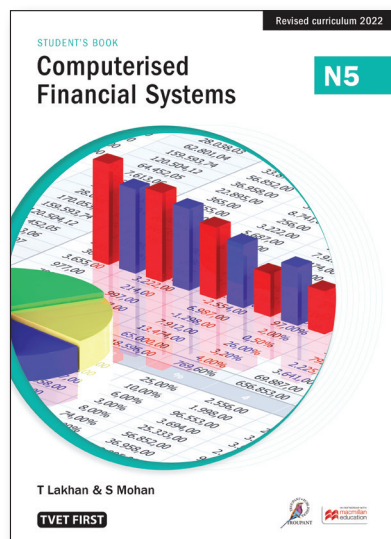
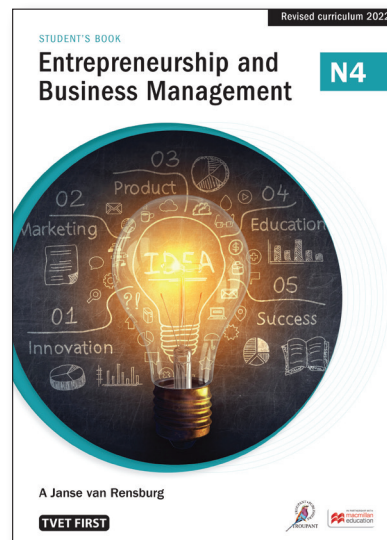
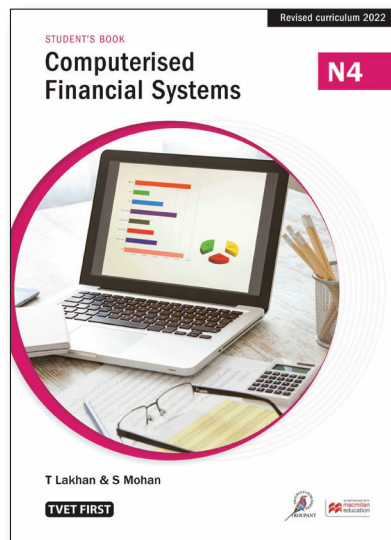
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Business



Computerised Financial Systems N4

Major changes to the 2020 curriculum

- The syllabus content has been restructured from ten modules into eight modules.
- Old technology (such as DOS commands, which was covered in the old Module 2) has been removed from the syllabus and replaced with Windows.
- Content that was previously covered in Module 3 (Mastering the keyboard) of the old syllabus is now included as part of the new Module 4.

The weightings in the new syllabus have also been amended. The following are the most significant changes:

- Module 1 (The use of a computer systems and computerised accounting) has been increased from 3% to 5%.
- Module 2 (Mastering a word processing program; previously Module 4) has been decreased from 10% to 5%.
- Modules 4, 5 and 6 (previously Modules 5, 6, 7 and 8), which deal with the set-up and processing of transactions (excluding adjustments), have increased from 57% to 70%.

Computerised Financial Systems N4 old and new syllabus weightings

Old syllabus module	Old syllabus weighting	New syllabus module	New syllabus weighting
Module 1: The use of a computer system (0.5 weeks)	3	Module 1: The use of computer systems and computerised accounting (1.5 weeks)	5
Module 2: Basic DOS commands (1 week)	5	Module 2: Mastering a word processing program (1.5 weeks)	5
Module 3: Mastering the keyboard (3 weeks)	10	Module 3: Theory and application of VAT (1 week)	5
Module 4: Mastering a word processing package (elementary) (2 weeks)	10	Module 4: Accounting cycle and set-up of new company parameters (1.5 weeks)	5
Module 5: Computerised accounting on a microcomputer (0.5 weeks)	2	Module 5: Take-on balances and processing of suppliers' and customers' transactions (3 weeks)	35
Module 6: Opening an accounting system of a service organisation (3 weeks)	20	Module 6: Processing of subsidiary journals and bank reconciliation statement (4 weeks)	30

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Old syllabus module	Old syllabus weighting	New syllabus module	New syllabus weighting
Module 7: Theory and application of value added tax (0.5 weeks)	5	Module 7: Sundry adjustments (2 weeks)	10
Module 8: Opening a trading concern (with VAT) (4 weeks)	30	Module 8: Financial statements (1.5 weeks)	5
Module 9: Adjustments (1 week)	10		
Module 10: Financial statements (report writer) (0.5 weeks)	5		
Total	100	Total	100

- Not much has changed with regards to the outcomes relating to computerised accounting software.
- There is more structure to the other outcomes. As such, outcomes have been moved to different modules where necessary to give the outcomes a more logical flow (that is, from the set-up, or creation, of a new business, to setting up the parameters of the new company, capturing opening balances, processing the current period's transactions and adjustments, and finally printing out the financial statements).
- There is less emphasis on service businesses and more emphasis on trading businesses.
- Old terminology for financial statements is still used in conjunction with the new terminology because the names of the statements have not been changed in the computerised accounting package.
- Content on VAT has been moved from the previous Modules 7 and 8 to Module 3 in the revised curriculum, as it is important that students understand VAT before processing transactions with VAT implications on the accounting system.

There is some emphasis on the theory of the accounting cycle. It is crucial that students understand this cycle fully, as it forms the basis for the processing flow on a computerised accounting system. This information is covered in Module 4 in the revised curriculum.

Curriculum changes in detail

The table that follows sets out the changes that have been made to the Computerised Financial Systems N4 syllabus. They are grouped as follows for ease of reference:

1. Brand new content (Colour coded in red)
2. Terminology and format changes in the syllabus and annexure (Colour coded in teal).

Computerised Financial Systems N4

Previous curriculum	New curriculum
Module 1: Introduction to computers 1.1 The concept computer and the functioning of a computer 1.2 The components of a computer system 1.3 Hardware: <ul style="list-style-type: none"> Central processing unit: <ul style="list-style-type: none"> Primary memory Control unit Logic unit Peripherals: <ul style="list-style-type: none"> Disk drives Keyboard Screen Printers Modems Software: <ul style="list-style-type: none"> Operating system Application programs 1.4 DOS operating system 1.4.1 Disk-based operating system (MS-DOS) and other types of operating systems 1.4.2 Switching on and loading of DOS on the computer. 1.5 Windows operating system Module 5: Computerised accounting of the microcomputer – Introduction 5.1 Characteristics of the chosen accountancy package 5.2 Installation procedure 5.3 The use of a reference manual issued with the package 5.4 The use of the help function for quick reference 5.5 Keyboard functions	Module 1: The use of computer systems and computerised accounting 1.1 The concept and function of a computer 1.2 The components of a computer 1.2.1 Hardware system: <ul style="list-style-type: none"> Central processing unit: <ul style="list-style-type: none"> Primary memory Control unit Logic unit Peripherals: <ul style="list-style-type: none"> Disk drives Keyboard Monitor Printers Modems 1.2.2 Software <ul style="list-style-type: none"> Operating system Application programs 1.3 Characteristics of the selected accounting system 1.4 The use of a reference manual issued with the program 1.5 The use of the help functions for quick reference

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Previous curriculum	New curriculum
<p>Module 2: Learning and application of DOS commands</p> <p>2.1 External and internal DOS-commands: FORMAT, FORMAT/V/S, LABEL, DISK-COPY, COMP, DISKCOMP, CHKDISK, BACKUP, RESTORE DIR, DIR/P, DIR/W, DEL, COPY, DATE, TIME, CLS, RE-BOOT, TYPE, RENAME Changing of active drive</p> <p>2.2 Setting of the DOS system</p> <p>2.3 Fault messages of DOS regarding internal and external commands</p> <p>2.4 The use of application programmes by means of the DOS operating system:</p> <ul style="list-style-type: none"> Types of application programmes, e.g. Pastel, WordPerfect, Lotus etc. 	<p>Not in the new curriculum</p>
<p>Module 3: Keyboard proficiency</p> <p>3.1 Mastery of the keyboard and the proficiency with regard to operating the computer keyboard and function keys:</p> <ul style="list-style-type: none"> Keyboard alphabet Numerical keys Special keys <p>3.2 Packages for keyboard and speed development (e.g. Typing Tutor)</p>	<p>Incorporated into the new Module 4</p>
<p>Module 4: Mastering a word processing package (elementary)</p> <p>4.1 Elementary word processing functions and the use of manuals:</p> <ul style="list-style-type: none"> Switching on and loading of the program Use of a main option list Procedure when switching off Creating of new documents 	<p>Module 2: Mastering a word processing program</p> <p>2.1. Word processing functions and the use of manuals:</p> <ul style="list-style-type: none"> Switch on and off procedures Use of a main option of program Creating of new documents Input and printout of text Quick cursor movement

Computerised Financial Systems N4

Previous curriculum	New curriculum
<ul style="list-style-type: none"> • Input of text • Printout of text • Quick cursor movement • Page down • Go to page • Store and retrieve • Hard space • Soft hyphen • Editing of text <ul style="list-style-type: none"> – Insert – Insert on/off – Delete/type over – Move – Copy – Centre – Tab stops – Indent – Underline – Bold – Set margins/line spacing – Page break – Page combine <p>4.2 The help function and 'pull-down menus'</p> <p>4.3 Application of commands with the word processing program:</p> <ul style="list-style-type: none"> • Unnumbered paragraphs • Numbered paragraphs • Memoranda • Letters • Tables 	<ul style="list-style-type: none"> • Page down • Go to page • Store and retrieve • Hard space • Soft hyphen • Editing of text: <ul style="list-style-type: none"> – Insert on and off – Delete or type over – Move/copy – Centre/tab stop – Indent/underline – Bold – Set margins/line spacing – Page break/page combine <p>2.2 The help function and 'pull-down menus'</p> <p>2.3. Application of commands with the aid of a word processing program:</p> <ul style="list-style-type: none"> • Unnumbered paragraphs/numbered paragraphs • Tables
<p>Module 7: The application of value added tax in a computerised set of accounts</p> <p>7.1 Description and outline of VAT</p> <p>7.2 Calculation of VAT</p> <p>7.3 Types of VAT supplies</p> <p>7.3.1 Zero-rated supplies</p> <p>7.3.2 Exempt supplies</p>	<p>Module 3: Theory and application of VAT</p> <p>3.1. Description and registration of VAT</p> <p>3.2. Types of VAT:</p> <p>3.2.1 Zero-rated supplies</p> <p>3.2.2 Exempt supplies</p> <p>3.3. Calculation and accounting procedures regarding VAT</p>

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Previous curriculum	New curriculum
	3.3.1. Procedure for calculation of input VAT: <ul style="list-style-type: none"> • Purchases • Discount allowed to customers • Returns from customers • Bad debts written off
	3.3.2 Procedures for calculation of output VAT: <ul style="list-style-type: none"> • Sale • Discount received from suppliers • Returns to suppliers • Bad debts recovered
	3.3.3 Adjustment of non-allowable VAT transaction
7.4 Registration for VAT	3.4 Completion of tax return form
7.5 Compliance with legal requirements	3.5 VAT compliance
7.5.1 Invoiced-based tax	3.5.1 Invoice-based tax
7.5.2 Payments-based tax	3.5.2 Payment-based tax
7.6 Tax period	3.6 Tax period
7.7 Requirements by the law for documents used in a VAT system	3.7 Law requirements for documents used in a VAT system
7.7.1 Tax invoice	3.7.1 Tax invoice
7.7.2 Credit/debit notes	3.7.2 Credit/debit notes
7.8 Law requirements for input and output tax:	3.8 Law requirements for input and output VAT
<ul style="list-style-type: none"> • Allowable deductions with regard to input tax • Charging of output tax 	3.8.1 Deduction with regards to input VAT 3.8.2 Processing output VAT
7.9 Accounting procedures with regard to VAT debtors:	
<ul style="list-style-type: none"> • Returns from debtors • Bad debts written off 	
7.9.1 Procedure for the calculation of input tax:	
<ul style="list-style-type: none"> • Stock purchases • Current and administration expenses • Capital expenses (fixed assets) • Discount allowed to debtors 	

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Previous curriculum	New curriculum
<ul style="list-style-type: none"> • Returns from debtors • Bad debts written off <p>7.9.2 Procedures for the calculation of output tax:</p> <ul style="list-style-type: none"> • Sale of stock or services rendered • Returns from creditors • Discount received from creditors • Bad debts recovered <p>7.9.3 Adjustment of a non-allowable VAT transaction</p> <p>7.10 Completion of the tax return form</p>	
<p>Module 8: The opening of a set of accounts for a trade organisation (including VAT)</p> <p>8.1 The creating of a set of accounts with previous month's balances</p> <p>8.2 The setting of the necessary parameters for opening a set of accounts that could function on an invoiced-based system</p> <p>8.3 The creating of subsidiary journals with relevant codes and parameters:</p> <ul style="list-style-type: none"> • Cash receipts journal • Cash payments journal • Debtors journal • Creditors journal • Debtors returns journal • Creditors returns journal • General journal • Interest charged journal • Bad debts journal • Stock journal <p>8.4 The creating of the general ledger accounts with codes and parameters</p>	<p>Module 4: Accounting cycle and set-up of new company parameters</p> <p>4.1 Accounting cycle</p> <p>4.2 Service and trading organisation transactions</p> <p>4.3 The setting of the necessary computer parameters for opening a new set of accounts that could also function on an invoice-based system.</p> <p>4.4 The set-up of subsidiary journals with relevant codes and parameters for cash and credit transactions:</p> <ul style="list-style-type: none"> • Cash books (bank, petty cash) • Customers journal • Customers allowances journal • Suppliers journal • Suppliers allowances journal • General journal • Interest charged journal • Bad debts journal • Stock journal <p>4.5 Creating of general ledger accounts with codes and parameters</p> <p>4.6 The set-up of the necessary parameters for suppliers and customers</p>

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Previous curriculum	New curriculum
	<p>4.7 The creating of suppliers' and customers' accounts with codes and the necessary parameters</p> <p>4.8 The setting-up of the necessary parameters for a continuous stock system</p> <p>4.9 Setting-up and creation of stock items at cost price in the stock system</p> <p>4.10 The printing of a complete stock list</p> <p>4.11 The establishing of the necessary parameters for the implementing of computerised invoices</p>
<p>Module 8: The opening of a set of accounts for a trade organisation (including VAT)</p> <p>8.5 The input of opening balances whereby debtors and creditors balances are included</p> <p>8.6 The input of the current age analysis for debtors</p> <p>8.7 The implementing of printouts for the accounts structure</p> <p>8.8 The setting of the necessary parameters for a continuous stock system</p> <p>8.9 Setting up of stock items and taking up stock items at cost price in the stock system</p> <p>8.10 The printing of a complete stock list</p> <p>8.11 The establishing of the necessary parameters for the implementing of computerised purchase notes</p> <p>8.12 The establishing of the necessary parameters for the implementing of computerised invoices</p>	<p>Module 5: Take-on balances and processing of suppliers' and customers' transactions</p> <p>5.1 Input of opening balances for general ledger accounts.</p> <p>5.2 View and printing of general ledger accounts transaction listings</p> <p>5.3 Input of suppliers and customers age analysis</p> <p>5.4 View and printing of periodic age analysis for suppliers and customers</p> <p>5.5 Taking up stock items at cost price in the stock system</p> <p>5.6 View and printing of inventory reports and master listings</p> <p>5.7 Source documents</p>

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Previous curriculum	New curriculum
<p>8.13 The input of credit and cash transactions from document batches, which include:</p> <ul style="list-style-type: none"> • Assets bought on credit and for cash • Trading stock bought for cash and on credit • Credit and cash sales (trading stock) • Income and expenses transactions (cash and credit) • Trading discount and discount received and allowed • Debtors payments and discount allowed • Creditors paid and discount received • All transactions regarding other cash receipts and payments 	<p>5.8 The input of credit and cash transactions from document batches, which include:</p> <ul style="list-style-type: none"> • Credit purchases of trading inventory • Returns to suppliers • Cash and credit sales of trading stock • Returns by customers • Trade discount, settlement and/or early payment terms
<p>Module 6: The opening of a set of accounts and input of cash and credit transactions for a service organisation</p> <p>6.1 Opening parameters</p> <p>6.1.1 The setting up of the necessary computer parameter for opening a set of accounts</p> <p>6.1.2 The creating of subsidiary journals with relevant codes and parameters for cash and credit transactions:</p> <ul style="list-style-type: none"> • Cash receipts journal (receipts cashbook) • Cash payments journal (payments cashbook) • Debtors journal • Creditors journal • Petty cash journal • Petty cash journal 	<p>Module 6: Processing of subsidiary journals and bank reconciliation statement</p> <p>Subsidiary journals</p> <p>6.1 Processing of subsidiary journals with relevant codes and parameters:</p> <ul style="list-style-type: none"> • Cash book: Bank (payments and receipts) • Cash book: Petty cash (payments) • Suppliers journal • Suppliers' allowances journal • Inventory journal • Interest-charged journal

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Previous curriculum	New curriculum
<p>6.1.3 The creating of general ledger accounts with codes and parameters</p> <p>6.2 The input of opening balances</p> <p>6.3 The input of cash and credit transactions from a list of documents</p> <p>6.3.1 Cash payments transactions:</p> <ul style="list-style-type: none"> • Fixed assets purchased • Current assets purchased • Payment of current expenses <p>6.3.2 Cash receipts transactions:</p> <ul style="list-style-type: none"> • Services rendered • Other income received: Rent received and interest received <p>6.3.3 Rendering of services on credit (debtors)</p> <p>6.4 General procedures with regard to petty cash transactions</p> <p>6.5 Input of the imprest amount in the petty cash</p> <p>6.6 Input of petty cash transactions from the petty cash vouchers</p> <p>6.7 Posting from the petty cash journal to the general ledger</p>	<p>6.2 The input of credit and cash transactions from batches of source documents, which include:</p> <ul style="list-style-type: none"> • Assets bought on credit and cash • Income and expenses transactions (cash and credit) • Discount received and allowed • Customer's payments and discount allowed • Payment of suppliers and discount received • Settlement of accounts • All transactions regarding other cash receipts and payments <p>6.3 General procedure about petty cash transactions</p> <p>6.4 Record of imprest amount in the petty cash</p> <p>6.5 Recording of petty cash transactions from petty cash vouchers</p> <p>6.6 Posting from petty cash journal to the general ledger</p> <p>6.7 Restoring of the imprest amount in the petty cash</p>

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Previous curriculum	New curriculum
<p>6.8 Restoring of the imprest amount in the petty cash</p> <p>6.9 The input of reconciliation items from a given bank statement and cash book (CRJ/CPJ):</p> <ul style="list-style-type: none"> • Outstanding deposits • Outstanding cheques • Bank charges levied • Interest levied • Debit orders paid by the bank • Cheques dishonoured • Incorrect entries in the bank statement or cash book <p>6.10 Reconciliation items on the previous month's reconciliation statement:</p> <ul style="list-style-type: none"> • Outstanding deposits • Outstanding cheques <p>6.11 The output of:</p> <ul style="list-style-type: none"> • The cash book (CRJ/CPJ) • Bank reconciliation statement • Bank account <p>6.12 Procedure with the posting of journals to the ledger</p> <p>6.13 Print out and interpreted the ledger accounts</p> <p>6.14 Print out and interpret the trial balance</p> <p>6.15 Print out all the relevant accounts and statements for a service organisation</p>	<p>Bank reconciliation statement</p> <p>6.8. Recording reconciliation items from a given bank statement and cash books (cash receipt and cash payments journal):</p> <ul style="list-style-type: none"> • Outstanding and direct deposits • Outstanding EFTs • Outstanding payments • Bank charges • Interest charged • Debit orders or stop orders • Incorrect entries in the bank statement or cash books <p>6.9 Reconcile amounts from the previous month's reconciliation statement</p> <p>6.10 The printouts or output of:</p> <ul style="list-style-type: none"> • Cash book (receipts and payments) after reconciliation • Bank reconciliation statement • Bank account

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Previous curriculum	New curriculum
Module 9: Adjustments at month end or financial period 9.1 Month-end adjustments 9.1.1 Correction of wrong entries 9.1.2 Correction of stock value 9.1.3 Journal entry for closing stock 9.1.4 Writing off bad debts 9.1.5 Bad debts recovered 9.1.6 Interest on debtors' accounts 9.2 Year-end adjustments 9.2.1 Provision for depreciation diminishing balance method and fixed instalment method 9.2.2 Provision for bad debts 9.2.3 Consumable stores on hand 9.2.4 Prepaid and accrued amounts 9.3 The printing of the adjusted journals, general ledger accounts and post adjustment trial balance	Module 7: Sundry adjustments 7.1 Month-end adjustments 7.1.1 Correction of wrong entries 7.1.2 Correction of stock value 7.1.3 Journal entry for closing stock 7.1.4 Writing off bad debts 7.1.5 Bad debts recovered 7.1.6 Interest on customer accounts 7.2 Year-end adjustments 7.2.1 Provision for depreciation 7.2.2 Provision for bad debts 7.2.3 Consumable stores on hand 7.2.4 Accounts payable and receivable 7.3 The printing of the adjusted journals, general ledger accounts and post-adjustment trial balance
Module 10: Set-up of financial statements through the report writer system 10.1 The input of standard parameters for the implementing of an income statement and balance sheet 10.2 Printing of financial statements	Module 8: Financial statements 8.1 Printing of the following financial statements/reports: <ul style="list-style-type: none"> • Trial balance • Income statement (Statement of comprehensive income) • Balance sheet (Statement of financial position) at the end of the financial period

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Entrepreneurship and Business Management N4

This document contains important information about the revised curriculum for Entrepreneurship and Business Management N4 for implementation in January 2022.

The main changes to this syllabus

1. Module 5: Introduction to the business plan **NEW and CHANGED content**

- The two outcomes that were covered in Module 9 (Presentation and evaluation of the business plan) in the 1998 syllabus have moved to Module 5 (Introduction to the business plan). There are now only eight modules in this course.
- The allocated weightings per module have changed, with more emphasis being placed on the challenges of entrepreneurship and the financial plan, and less emphasis on the financial feasibility study, and the introduction to and presentation of the business plan.

2. Allocation of weighted values per module **CHANGED**

Module	Old value (1998 syllabus)	New value (2022 syllabus)
1. The contemporary challenges of entrepreneurship	12	15
2. Creativity and idea generation	13	10
3. Market feasibility study	15	15
4. Financial feasibility study	18	10
5. Introduction to the business plan	15	15
6. Marketing plan	9	10
7. Management plan	9	10
8. Financial plan	9	15
9. Presentation and evaluation of the business plan	6	0

The 2022 syllabus gives more guidance on the following:

1. Prerequisite

A student must have passed Business Economics or Economics in the National Senior certificate (NSC), the National Certificate Vocational (NCV) Level 4 or an equivalent. A pass in Mathematical Literacy and Accounting provides entrance for students who obtained a Senior Certificate, but initially lacked the required subject to enrol for Entrepreneurship and Business Management N4.

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2. Evaluation

The semester mark will consist of three components with the following weighted values:

- Assessment 1 (Business plan): 20%
- Assessment 2 (Written test): 30%
- Assessment 3 (Internal examination): 50%.

Written assessment must include various cognitive skills listed in Bloom's taxonomy. The prescribed weighting for each of these skills is presented in the table that follows.

Recall	Application	Comprehension	Synthesis	Analysis/ Evaluation
20–25	20–30	25–30	10–20	10–20

Content from the previous curriculum that has changed in this curriculum

- **Old content (1998 syllabus) that has changed (in 2022 syllabus):**
 - Module 2, LO 2.4 (Creativity methods): The existing concept has been replaced with the reverse method.
 - Module 3, LO3.3.2 (Methods of collecting primary data – Surveys): The postal method has been replaced with the mail survey and the online survey.
 - Module 5, LO 5.1.3 (Description of proposed business). SWOT analysis and legal requirements have been relocated here.
 - Module 5, LO 5.1.4 (Marketing plan): Market research is now included here.
 - Module 5, LO 5.2 (Where to find assistance): SBDC has changed to SEDA and the Small Business Advisory Bureaus has changed to Small Medium Micro Enterprises.
 - The requirements for Task 1.8 have changed. Students are required to do a personal resource analysis and must list their personal entrepreneurial qualities as part of the self-analysis for this task.
- **Old content (1998 syllabus) that has been deleted (in 2022 syllabus):**
 - Module 5: Two points have changed in LO 5.2 (Where to find assistance). Content on SBDC and the Small Business Advisory Bureaus has been deleted and replaced with information on new organisations.
 - Module 7: One point has been deleted from LO 7.1 (Type of business). Close corporations are no longer dealt with in the syllabus.
 - Module 7: Two points have been deleted from LO 7.3 (Legal formalities in establishing a business). These are content relating to close corporations and the registrar of close corporations.

Entrepreneurship and Business Management N4

Entrepreneurship and Business Management N4 syllabus comparison (1998 and 2022)

The comparison that follows sets out the changes that have been made to the EBM N4 syllabus, with the 2022 syllabus presented in the right-hand column of the table and the relevant outcomes from the 1998 syllabus for EBM N4 in the left-hand column. Changes have been noted in RED for ease of reference.

1998 syllabus	Curriculum for implementation in 2022
Module 1: The challenges of entrepreneurship 1. Entrepreneurship 1.1 The role of entrepreneurs and intrapreneurs 1.2 Personal qualities of the entrepreneur: <ul style="list-style-type: none"> Confidence in their ability to succeed Preference for moderate risk Desire for responsibility Energetic Identify opportunities Skill at organising Urge to achieve Desire for immediate feedback 1.3 Personal resources of the successful entrepreneur: <ul style="list-style-type: none"> Knowledge and skills Contacts and friends Finance (personal assets and liabilities) 1.4 Economic importance of the entrepreneur: <ul style="list-style-type: none"> Developing of natural resources Creates employment opportunities Leads in production Free market system dependant on entrepreneurs 1.5 The merits of entrepreneurship: <ul style="list-style-type: none"> To gain control over your own destiny To reach your full potential To reap unlimited profits To contribute to society and be recognised for your efforts 	Module 1: The contemporary challenges of entrepreneurship 1. Entrepreneurship 1.1 The role of entrepreneurs and intrapreneurs 1.2 Personal qualities of the entrepreneur: <ul style="list-style-type: none"> Confidence in their ability to succeed Preference for moderate risk Desire for responsibility Energetic Identify opportunities Skill at organising Urge to achieve Desire for immediate feedback 1.3 Personal resources of the successful entrepreneur: <ul style="list-style-type: none"> Knowledge and skills Contacts and friends Finance (personal assets and liabilities) 1.4 Economic importance of the entrepreneur: <ul style="list-style-type: none"> Developing of natural resources Creates employment opportunities Leads in production Free market system dependant on entrepreneurs 1.5 The merits of entrepreneurship: <ul style="list-style-type: none"> To gain control over your own destiny To reach your full potential To reap unlimited profits To contribute to society and be recognised for your efforts

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1998 syllabus	Curriculum for implementation in 2022
<p>1.6 Why entrepreneurs fail:</p> <ul style="list-style-type: none"> • Management incompetence • Lack of experience • Poor financial control <p>1.7 How to avoid the pitfalls:</p> <ul style="list-style-type: none"> • Prepare a business plan • Know your business • Understand financial statements • Learn to manage people effectively • Entrepreneurial transition <p>1.8 Task: Complete a self-analysis, as well as listing personal strengths and weaknesses, possible contacts and personal investment capabilities</p>	<p>1.6 Why entrepreneurs fail:</p> <ul style="list-style-type: none"> • Management incompetence • Lack of experience • Poor financial control <p>1.7 How to avoid the pitfalls:</p> <ul style="list-style-type: none"> • Prepare a business plan • Know your business • Understand financial statements • Learn to manage people effectively • Entrepreneurial transition <p>1.8 Task: Complete a self-analysis, as well as outlining personal strengths and weaknesses, personal resources analysis and personal entrepreneurial qualities</p>
<p>Module 2: Creativity and idea generation</p> <p>2. Creativity</p> <p>2.1 Ideas and opportunities</p> <p>2.2 Innovation and creativity</p> <p>2.3 Generating ideas from:</p> <ul style="list-style-type: none"> • Everyday activities • Other sources • Generic needs <p>2.4 Creativity methods:</p> <ul style="list-style-type: none"> • Existing concept • Attribute analysis • Problem redefinition • Forced connection • Mind mapping • Brainstorming • Metaphorical analogy <p>2.5 Protecting your ideas:</p> <ul style="list-style-type: none"> • Secrecy • Patents • Trademarks • Copyright 	<p>Module 2: Creativity and idea generation</p> <p>2. Creativity</p> <p>2.1 Ideas and opportunities</p> <p>2.2 Innovation and creativity</p> <p>2.3 Generating ideas from:</p> <ul style="list-style-type: none"> • Everyday activities • Other sources • Generic needs <p>2.4 Creativity methods:</p> <ul style="list-style-type: none"> • Reverse method • Attribute analysis • Problem redefinition • Forced connection • Mind mapping • Brainstorming • Metaphorical analogy <p>2.5 Protecting your ideas:</p> <ul style="list-style-type: none"> • Secrecy • Patents • Trademarks • Copyright

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
<p>2.6 Turning ideas into opportunities:</p> <p>(i) Identify the good ideas</p> <ul style="list-style-type: none"> ● Match ideas to your personal resources ● Strengths, contacts and finance <p>(ii) Identify opportunities</p> <ul style="list-style-type: none"> ● Will it be worthwhile? ● Will I make a profit? ● Profit: Difference between the selling price and the cost price. Multiply by the number of items sold and subtract the expenses. <p>2.7 Task: Apply the creativity methods to turn ideas into opportunities for your small business</p> <p>2.8 Business plan: Students must select their specific product or service</p>	<p>2.6 Turning ideas into opportunities:</p> <p>(i) Identify the good ideas</p> <ul style="list-style-type: none"> ● Match ideas to your personal resources ● Strengths, contacts and finance <p>(ii) Identify opportunities</p> <ul style="list-style-type: none"> ● Will it be worthwhile? ● Will I make a profit? ● Profit: Difference between the selling price and the cost price. Multiply by the number of items sold and subtract the expenses. <p>2.7 Task: Apply the creativity methods to turn ideas into opportunities for your small business</p> <p>2.8 Business plan: Students must select their specific product or service</p>
<p>Module 3: Market feasibility study</p> <p>3. Importance of a feasibility study</p> <p>3.1 Product description</p> <p>3.1.1 Nature of product:</p> <ul style="list-style-type: none"> ● Industrial products ● Consumer products ● Services <p>3.2 Identify the market position:</p> <ul style="list-style-type: none"> ● Identify target market ● Market description, age, income, gender, education, location, occupation and decision makers ● Market segmentation, target market, methods of segmentation ● Market share, or indicators of market growth <p>3.3 Marketing information</p> <p>3.3.1 Collection of data:</p> <ul style="list-style-type: none"> ● Primary data ● Secondary data 	<p>Module 3: Market feasibility study</p> <p>3. Importance of a feasibility study</p> <p>3.1 Product description</p> <p>3.1.1 Nature of product:</p> <ul style="list-style-type: none"> ● Industrial products ● Consumer products ● Services <p>3.2 Identify the market position:</p> <ul style="list-style-type: none"> ● Identify target market ● Market description, age, income, gender, education, location, occupation and decision makers ● Market segmentation, target market, methods of segmentation ● Market share, or indicators of market growth <p>3.3 Marketing information</p> <p>3.3.1 Collection of data:</p> <ul style="list-style-type: none"> ● Primary data ● Secondary data

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1998 syllabus	Curriculum for implementation in 2022
<p>3.3.2 Methods of collecting primary data:</p> <ul style="list-style-type: none"> • Surveys • Questionnaire • Telephone • Postal • Observation • Experiments • Test marketing <p>3.3.3 Developing the questionnaire</p> <p>3.3.4 Collecting secondary data</p> <p>3.4 Task: Student must apply the market research technique in testing the market potential of their product/service</p> <p>3.5 Assessment of the strengths and weaknesses of the enterprise:</p> <ul style="list-style-type: none"> • Scan environment for opportunities and threats (SWOT analysis) <p>3.6 Identification of competitive advantage:</p> <ul style="list-style-type: none"> • Analyse competition 	<p>3.3.2 Methods of collecting primary data:</p> <ul style="list-style-type: none"> • Surveys • Questionnaire • Telephone • Mail survey • Online survey • Observation • Experiments • Test marketing <p>3.3.3 Developing the questionnaire</p> <p>3.3.4 Collecting secondary data</p> <p>3.4 Task: Student must apply the market research technique in testing market potential of their product/service</p> <p>3.5 Assessment of the strengths and weaknesses of the enterprise:</p> <ul style="list-style-type: none"> • Scan environment for opportunities and threats (SWOT analysis) <p>3.6 Identification of competitive advantage:</p> <ul style="list-style-type: none"> • Analyse competition
<p>Module 4: Financial feasibility study</p> <p>4. Financial feasibility study</p> <p>4.1 Importance of a financial feasibility study:</p> <ul style="list-style-type: none"> • Profit • Sales • Fixed costs • Operating costs • Break-even analysis <p>4.2 Start-up costs</p> <p>4.2.1 Fixed assets required:</p> <ul style="list-style-type: none"> • List of assets • Purchase price • Expenditure • Financing <p>4.2.2 Pre-operating costs</p>	<p>Module 4: Financial feasibility study</p> <p>4. Financial feasibility study</p> <p>4.1 Importance of a financial feasibility study:</p> <ul style="list-style-type: none"> • Profit • Sales • Fixed costs • Operating costs • Break-even analysis <p>4.2 Start-up costs</p> <p>4.2.1 Fixed assets required:</p> <ul style="list-style-type: none"> • List of assets • Purchase price • Expenditure • Financing <p>4.2.2 Pre-operating costs</p>

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
<p>4.3 Total costs:</p> <ul style="list-style-type: none"> • Fixed cost • Variable costs <p>4.4 Sales scenarios:</p> <ul style="list-style-type: none"> • Cost price of product/service • Suppliers • Competition • Selling price <p>4.4.1 Contribution per unit or gross profit or profit mark-up</p> <p>4.4.2 Turnover for a specific profit goal</p> <p>4.4.3 Break-even point:</p> <ul style="list-style-type: none"> • In units • Turnover 	<p>4.3 Total costs:</p> <ul style="list-style-type: none"> • Fixed cost • Variable costs <p>4.4 Sales scenarios:</p> <ul style="list-style-type: none"> • Cost price of product/service • Suppliers • Competition • Selling price <p>4.4.1 Contribution per unit or gross profit or profit mark-up</p> <p>4.4.2 Turnover for a specific profit goal</p> <p>4.4.3 Break-even point:</p> <ul style="list-style-type: none"> • In units • Turnover
<p>Module 5: Introduction to the business plan</p> <p>5. The business plan</p> <p>5.1 Elements of a business plan</p> <p>5.1.1 Cover sheet:</p> <ul style="list-style-type: none"> • Business plan • Entrepreneur's name • Address of business <p>5.1.2 Executive summary:</p> <ul style="list-style-type: none"> • Highlight of key materials in the plan <p>5.1.3 Description of proposed business:</p> <ul style="list-style-type: none"> • General description of the intended product or service • Key objectives • Significant characteristics of the industry • Unique features of the product or service <p>5.1.4 Marketing plan:</p> <ul style="list-style-type: none"> • Target market, key customers, the competition, market share and opportunities, competitive advantage, locality, promotion strategies 	<p>Module 5: Introduction to the business plan</p> <p>5 The business plan</p> <p>5.1 Elements of a business plan</p> <p>5.1.1 Cover sheet:</p> <ul style="list-style-type: none"> • Business plan • Entrepreneur's name • Address of business <p>5.1.2 Executive summary:</p> <ul style="list-style-type: none"> • Highlight of key materials in the plan <p>5.1.3 Description of proposed business:</p> <ul style="list-style-type: none"> • General description of the intended product or service • Key objectives • Significant characteristics of the industry • Unique features of the product or service • SWOT analysis • Legal requirements <p>5.1.4 Marketing plan:</p> <ul style="list-style-type: none"> • Target market, market research, key customers, the competition, market share and opportunities, competitive advantage, locality, promotion strategies

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
<p>5.1.5 Management plan:</p> <ul style="list-style-type: none"> Form of ownership, description of key people's skills and responsibilities, organisational structure, operating plan, administrative policies <p>5.1.6 Financial plan:</p> <ul style="list-style-type: none"> Start-up costs, cash flow statement, income statement, loan amount required and repayment schedule <p>5.1.7 Appendix of supporting materials:</p> <ul style="list-style-type: none"> Credit reports, reference letter, legal documents, résumés, copies of contracts and leases <p>5.2 Where to find assistance:</p> <ul style="list-style-type: none"> SBDC Commercial banks Small Business Advisory Bureaus Institutions Information Information on: Personal matters Productivity Insurance Legal matters Taxation Advertising Market research Franchise association <p>5.3 Naming the business</p> <p>5.4 Task: Students must complete the cover sheet and description of the business, as well as the relevant sections of the marketing, management and financial plans from the information gathered in the feasibility studies</p>	<p>5.1.5 Management plan:</p> <ul style="list-style-type: none"> Form of ownership, description of key people's skills and responsibilities, organisational structure, operating plan, administrative policies <p>5.1.6 Financial plan:</p> <ul style="list-style-type: none"> Start-up costs, cash flow statement, income statement, loan amount required and repayment schedule <p>5.1.7 Appendix of supporting materials:</p> <ul style="list-style-type: none"> Credit reports, reference letter, legal documents, résumés, copies of contracts and leases <p>5.2 Where to find assistance:</p> <ul style="list-style-type: none"> SEDA Commercial banks Small Medium Micro Enterprises Institutions Information Information on: Personal matters Productivity Insurance Legal matters Taxation Advertising Market research Franchise association <p>5.3 Naming the business</p> <p>5.4 Presentation and evaluation of business plan</p> <p>5.4.1 Evaluation of the business plan</p> <p>5.5 Task: Students must complete the cover sheet and description of the business, as well as the relevant sections of the marketing, management and financial plans from the information gathered in the feasibility studies</p>

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
Module 6: Marketing plan 6. Marketing mix: <ul style="list-style-type: none"> Product, place, price, promotion 6.1 Product description 6.1.1 Packaging 6.2 Pricing for profit: (i) Pricing techniques (ii) Pricing concepts <ul style="list-style-type: none"> Total costs = Variable costs + Expenses + Fixed cost Mark-up $\text{Rand mark-up} = \text{Retail price} - \text{Cost of merchandise}$ 6.3 Promotion 6.3.1 Goals of advertising 6.3.2 Selecting advertising media 6.3.3 Developing an advertising plan: <ul style="list-style-type: none"> Creating an advertising message Effective advertising Measure results 6.3.4 Preparing an advertising budget 6.3.5 Sales promotion 6.3.6 Personal selling: <ul style="list-style-type: none"> Obtain the necessary knowledge Develop a selling system Sales letter Customer relations and service 6.3.7 Turning slow-moving inventory into cash 6.3.8 After-sales services 6.4 Place 6.4.1 Locality: <ul style="list-style-type: none"> Criteria for locating a retail and service business Criteria for locating a small manufacturer Describe how the type of manufacturing business influences the choice of a locality 	Module 6: Marketing plan 6. Marketing mix: <ul style="list-style-type: none"> Product, place, price, promotion 6.1 Product description 6.1.1 Packaging 6.2 Pricing for profit: (i) Pricing techniques (ii) Pricing concepts <ul style="list-style-type: none"> Total costs = Variable costs + Expenses + Fixed cost Mark-up $\text{Rand mark-up} = \text{Retail price} - \text{Cost of merchandise}$ 6.3 Promotion 6.3.1 Goals of advertising 6.3.2 Selecting advertising media 6.3.3 Developing an advertising plan: <ul style="list-style-type: none"> Creating an advertising message Effective advertising Measure results 6.3.4 Preparing an advertising budget 6.3.5 Sales promotion 6.3.6 Personal selling: <ul style="list-style-type: none"> Obtain the necessary knowledge Develop a selling system Sales letter Customer relations and service 6.3.7 Turning slow-moving inventory into cash 6.3.8 After-sales services 6.4 Place 6.4.1 Locality: <ul style="list-style-type: none"> Criteria for locating a retail and service business Criteria for locating a small manufacturer Describe how the type of manufacturing business influences the choice of a locality

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
6.4.2 Layout	6.4.2 Layout
6.5 Prepare the marketing plan of your proposed business plan	6.5 Prepare the marketing plan of your proposed business plan
Module 7: Management plan 7.1 Type of business: <ul style="list-style-type: none"> • One-man business • Partnership • Private company • Close corporation 7.2 Which form of ownership? <ul style="list-style-type: none"> • Size of business • Nature of product/service • Liabilities • Capital required 7.3 Legal formalities in establishing a business: <ul style="list-style-type: none"> • How to get a trading licence? • Sole trade • Partnership • Articles of partnership • Private company • Companies Act • Registrar of companies • Close corporations • Registrar of close corporations 7.4 Own involvement 7.5 Personnel and responsibilities 7.6 Operating plan 7.7 Equipment/machinery analysis 7.8 Supplier analysis 7.9 Office administration 7.10 Prepare the management plan of your proposed business plan	Module 7: Management plan 7.1 Type of business: <ul style="list-style-type: none"> • Sole proprietor (one-man business) • Partnership • Company (Pty) Ltd 7.2 Which form of ownership? <ul style="list-style-type: none"> • Size of business • Nature of product/service • Liability • Capital required 7.3 Legal formalities in establishing a business: <ul style="list-style-type: none"> • How to get a trading licence? • Sole proprietor • Partnership • Articles of partnership • Company (Pty) Ltd • Companies Act • Registrar of companies 7.4 Own involvement 7.5 Personnel and responsibilities 7.6 Operating plan 7.7 Equipment/machinery analysis 7.8 Supplier analysis 7.9 Office administration 7.10 Prepare the management plan of your proposed business plan
Module 8: Financial plan 8.1 Sources of financing 8.1.1 Capital: <ul style="list-style-type: none"> • Fixed capital • Working capital • Growth capital 	Module 8: Financial plan 8.1 Sources of financing 8.1.1 Capital: <ul style="list-style-type: none"> • Fixed capital • Working capital • Growth capital

Entrepreneurship and Business Management N4

1998 syllabus	Curriculum for implementation in 2022
8.1.2 Equity financing	8.1.2 Equity financing
8.1.3 Borrowed capital	8.1.3 Borrowed capital
8.2 Financial management	8.2 Financial management
8.3 Creating projected financial statements	8.3 Creating projected financial statements
8.3.1 Projected cash flow statement: <ul style="list-style-type: none"> Forecasting, sales, cash receipts, cash disbursements The end-of-month cash balance 	8.3.1 Projected cash flow statement: <ul style="list-style-type: none"> Forecasting, sales, cash receipts, cash disbursements The end-of-month cash balance
8.3.2 Projected income statement: <ul style="list-style-type: none"> Develop sales forecast Develop estimated monthly expenses 	8.3.2 Projected income statement: <ul style="list-style-type: none"> Develop sales forecast Develop estimated monthly expenses
8.4 Determine loan requirement	8.4 Determine loan requirement
8.5 Prepare the financial plan of your proposed business plan	8.5 Prepare the financial plan of your proposed business plan.
Module 9: Presentation and evaluation of the business plan 9.1 Presentation of the business plan 9.2 Evaluation of the business plan	(The 2022 syllabus no longer has a Module 9. These outcomes have moved to Module 5; see 5.4 and 5.4.1.)

Features of TVET First Entrepreneurship and Business Management N4

- This edition of the book includes all of the additions and changes made to the syllabus and follows the order of the new syllabus.
- The Student's Book includes tasks as prescribed by the syllabus, per module, which can be used for the students' practical mark for the semester.
- The accompanying Lecturer's Guide includes the following:
 - Background information
 - Suggested teaching plan
 - Lesson plan template
 - Comprehensive answers
 - Memorandum to the practice examination.
- There is a Workbook that provides space for students to write their answers to all the activities and tasks in the Student's Book.

Our new book has been completely updated

- This version of the book **adheres 100% to the new curriculum**. In addition, the content is presented in the order in which it is listed in the syllabus.

Entrepreneurship and Business Management N4

- The content (theory) of the new syllabus had been updated where necessary and according to the newest theory and information based on this syllabus.
- The book includes additional **practical examples** to familiarise students with current situations and demands in the entrepreneurial world.
- Each module begins with a **starter activity** that enables the student to relate to the content of the new module. In some instances, this activity is based on embedded knowledge from previous modules.
- A **clear summary** is included at the end of each module.
- Each module has ample activities (individual, group and class).
- There are many **case studies** (real-life scenarios) to develop and test students' ability to apply their knowledge.
- Theory is presented in an **easy-to-read format**. Short sentences, bulleted lists, tables and mind maps are used to increase the readability of the content.
- The modules include references and links to appropriate **online materials and videos** where students can learn more about certain topics.
- **Practical examples** are given in each module.
- Detailed **financial explanations** are given with relevant examples.
- The entire book is **colour-coded** for ease of reference. For example, tasks relating to business plans are in green, case studies are in pink, activities are highlighted in yellow and summative assessments are highlighted in pale yellow.
- Annexure 1 is a complete **business plan**, colour-coded in green.
- **Tasks** that are aligned with the syllabus have been included in every module to assist the lecturer with the practical component, which comprises 20% of the semester mark. In order to make the completion and assessment of these tasks easier, the Workbook includes a blank template of a business plan and the Lecturer's Guide gives helpful guidance on the marking of the practical assessment.
- The book includes a comprehensive **glossary**.

Some more aspects

This series consists of the following components:

- a colour-coded **Student's Book**
- a **Lecturer's Guide**, which includes helpful and interesting background information, a suggested teaching plan and, a lesson plan template, comprehensive answers to all the activities in the Student's Book a photocopiable practice exam and a marking guideline to be used in assessing the practice exam
- a **Workbook**, making extra handouts or templates unnecessary
- **PowerPoint slides** to be used in conjunction with the Student's Book; some of these slides include videos in which calculations are explained.

TVET First author

A Janse van Rensburg



Computerised Financial Systems N5

Overview of main curriculum changes

- The following modules are new to the syllabus (moved from the OLD Computerised Financial Systems N6 syllabus):
 - Analysis and interpretation of financial statements on a spreadsheet
 - Financial reports (Report Writer) on an accounting package
 - Budgets on an accounting package.
- The following modules have been moved to the NEW Computerised Financial Systems N6 syllabus:
 - Salaries and wages (using a spreadsheet package)
 - Salaries and wages (using a computer package).
- The following modules have been removed from the syllabus:
 - Dealing with a fixed asset package on the computer
 - Document project on a computerised accounting system.
- The new syllabus replaces outdated accounting terminology with the terminology used in the latest accounting standards as set out in the International Financial Reporting Standards (IFRS), for example, 'statement of comprehensive income', 'statement of financial position', 'statement of cash flow', 'inventory turnover rate', 'trade receivables collection period', 'trade payables settlement period' and 'trade receivables turnover rate'.
- The weightings in the new syllabus have also been amended. The most significant changes are set out in the table that follows.

Previous curriculum (1995)		New curriculum (June 2022)	
Module	Weighting (%)	Module	Weighting (%)
Module 1: Wages and salaries journal (computer package)	25	Not in the new syllabus.	
Module 2: Dealing with a fixed asset package on the computer	5	Not in the new syllabus.	
Module 3: Document project on a computerised accounting system	30	Not in the new syllabus.	
Module 4: Mastering a spreadsheet package: Elementary	10	Module 1: Mastering a spreadsheet program	5

Computerised Financial Systems N5

Previous curriculum (1995)		New curriculum (June 2022)	
Module	Weighting (%)	Module	Weighting (%)
Module 5: Elementary financial accounting applications on spreadsheets	10	Module 2: Financial accounting applications on a spreadsheet	10
		Module 3: Financial statements applications on a spreadsheet	15
Module 6: Elementary cost and management accounting applications on a spreadsheet	20	Module 4: Basic cost and management accounting applications on a spreadsheet	15
		Module 5: Analysis and interpretation of financial statements on a spreadsheet	15
		Module 6: Financial reports (Report Writer) on an accounting package (Pastel Partner)	20
		Module 7: Budgets on an accounting package (Pastel Partner)	20

Ways in which the 2022 syllabus is more structured than the old syllabus

- Modules with content that could not be examined weighing a total of 35% (the old Modules 2 and 3) have been replaced with modules and outcomes that are examinable and relevant.
- It is more in line with the Financial Accounting N5 syllabus, as it now includes a module on the analysis and interpretation of financial statements.
- There is more continuation from the Computerised Financial Systems N4 revised syllabus, as the module on Pastel Accounting has been moved from Computerised Financial Systems N6 to N5.

Curriculum changes in detail

The table that follows sets out the changes that have been made to the Computerised Financial Systems N5 syllabus.

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
Module 1: Wages and salaries journal (computer package) 1.1 Characteristics of the chosen accountancy package 1.2 Installation procedure 1.3 The use of the reference manual issued with the package 1.4 The use of the help function for quick reference 1.5 The requirements of the Receiver of Revenue and the Regional Services Council 1.6 Menu for the computer package 1.7 Parameters for the opening of a wages and salaries system 1.7.1 System creation 1.7.2 Installation: <ul style="list-style-type: none"> • Backup • Create employees • Create information for deductions 1.8 Input of transactions: <ul style="list-style-type: none"> 1.8.1 New employees 1.8.2 Delete employees 1.8.3 Employees on leave 1.8.4 Changes in tax status 1.8.5 Change from basic salary to hourly wage or vice versa 1.8.6 Upgrading of changes in tax 1.8.7 Weekly/monthly procedures (including posting to the integrated computer system) 1.9 Source documents: <ul style="list-style-type: none"> • Pay slips • Wage/salary sheet • Cheques for payment • Other weekly/monthly reports 1.10 Year-end procedure 1.11 Tax reconciliation	<p><i>Not in the new syllabus.</i></p> <p><i>This module has been moved to the Computerised Financial Systems N6 syllabus.</i></p>

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
Module 2: Dealing with a fixed asset package on the computer 2.1 Introduction to a fixed asset package 2.2 Requirements for the management of fixed assets 2.3 File menu for the chosen fixed asset package 2.4 Parameters for the compilation of a fixed asset system 2.5 Transactions and procedures: <ul style="list-style-type: none"> • Fixed asset register • Purchase and sale of fixed assets • Depreciation • Year-end procedure 2.6 Updating of tax alterations	<i>Not in the new syllabus.</i>
Module 3: Document project on a computerised accounting system 3.1 A practical computer project that includes the following: <ul style="list-style-type: none"> 3.1.1 Create a new set of accounts for a small to medium-sized business – registered for VAT, with a stock system, debtors and creditors, wages and salaries 3.1.2 Setting of parameters 3.1.3 Input of subsidiary journals 3.1.4 Bank reconciliation 3.1.5 Posting to ledger 3.1.6 Completion of two-monthly tax return form 3.1.7 Adjustments 3.1.8 Printouts for: <ul style="list-style-type: none"> • Computerised input documents: purchase notes, invoices, debit notes and credit notes • Subsidiary journals • General ledger • Wages and salaries journal • Debtors and creditors accounts • Monthly statements with age analysis • Trial balance 	<i>Not in the new syllabus.</i>

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
<ul style="list-style-type: none"> • Stock reports • VAT report 	
Module 4: Mastering a spreadsheet package: Elementary 4.1 Purpose and uses of a spreadsheet 4.2 Use of a spreadsheet manual 4.3 The help function 4.4 Knowledge and application of spreadsheet commands and formulas: <ul style="list-style-type: none"> • Install the program • Option list • Input of information • Load a file • Clear a screen • Quit • Copying of contents: <ul style="list-style-type: none"> – One cell to a row – Row to row – One cell to another cell • Arithmetic functions: <ul style="list-style-type: none"> + (add) - (subtract) * (multiply) / (divide) SUM (for adding a sequence of cells) • Make a printout of a spreadsheet without a frame and with adjustments to page length • Set width and margins • Edit a spreadsheet: <ul style="list-style-type: none"> – Delete a cell, a block, a column or a row – Add a row and a column – Change the width of one column or global column width – Format a column for rands and cents – Format a column for decimal figures to whole numbers and vice versa – Draw lines (repeat code) 	Module 1: Mastering a spreadsheet program 1.1 Function of a spreadsheet 1.2 Use of spreadsheet manual 1.3 The help functions 1.4 Application of spreadsheet commands and formulas: <ul style="list-style-type: none"> • Option list • Input of information • Clear screen • Copying of contents: <ul style="list-style-type: none"> – One cell to a row – Row to a row – One cell to one cell • Arithmetic functions: <ul style="list-style-type: none"> + (add) - (subtract) * (multiply) / (divide) Sum (for adding a sequence of cells) • Make a printout without a frame but adjusted to page length • Set width and margins • Edit a spreadsheet: <ul style="list-style-type: none"> – Add a row and a column – Change the width of a column – Delete a cell, a block, a column and a row – Format a column for rands and cents, and for decimal figures to whole numbers and vice versa

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
Module 5: Elementary financial accounting applications on spreadsheets 5.1 Stock keeping on spreadsheets 5.1.1 Draw up a detailed stock sheet with between two and five stock items with the following columns: <ul style="list-style-type: none"> • Stock code • Item description • Quantity • Cost price • Selling price (VAT included) • Selling price (VAT excluded) • Column totals 5.1.2 Draw up a gross profit stock report with between two and five stock items with the following columns: <ul style="list-style-type: none"> • Stock code • Item description • Quantity • Cost price • Selling price (VAT excluded) • Gross profit amount • Gross profit percentage • Column totals 5.1.3 Draw up a wages and salaries journal for between two and five employees with the following columns: <ul style="list-style-type: none"> • Normal time (employees, hours, tariff, amount) • Overtime (hour, tariff, amount) • Gross wage • Deductions (pension, medical aid, PAYE, etc.) • Employers contributions (pension, unemployment, medical aid, etc.) 5.1.4 Draw up a cash flow statement	Module 2: Financial accounting applications on a spreadsheet 2.1 Stock keeping on a spreadsheet 2.1.1 Draw up stock sheet with two to five stock items and with the following columns: <ul style="list-style-type: none"> • Stock code • Item description • Quantity • Cost price • Selling price (VAT exclusive) • VAT • Selling price (VAT inclusive) • Total column 2.1.2 Draw up gross profit stock report with two to five stock items and with the following columns: <ul style="list-style-type: none"> • Stock code • Item description • Quantity • Cost price • Selling price (VAT exclusive) • VAT • Selling price (VAT inclusive) • Gross profit amount • Gross profit percentage • Stock on hand <p><i>Not in the new syllabus.</i></p> <p><i>This module has been moved to the Computerised Financial Systems N6 syllabus.</i></p> <p><i>Moved to Module 3. Note that the accounting terminology used has been updated.</i></p>

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
<p>5.1.5 Draw up an income statement with the following sections:</p> <ul style="list-style-type: none"> • Gross profit section • Net profit section • Net profit transferred to capital <p>5.1.6 Draw up a balance sheet with the following sections:</p> <ul style="list-style-type: none"> • Capital employed: <ul style="list-style-type: none"> – Owner's equity – Long-term liabilities • Employment of capital: <ul style="list-style-type: none"> – Fixed assets – Net working capital – Current assets less current liabilities 	<p><i>Moved to Module 3. Note that the accounting terminology used has been updated.</i></p> <p><i>Moved to Module 3 – take note of all the new accounting terminology.</i></p> <p>2.2 Inventory valuation on a spreadsheet</p> <p>2.2.1 Draw up an inventory stock sheet using the FIFO method</p> <p>2.2.2 Draw up an inventory stock sheet using the weighted average method</p> <p>Module 3: Financial statements applications on a spreadsheet</p> <p>3. Financial statements applications for a sole trader</p> <p>3.1 Draw up a statement of comprehensive income with the following sections:</p> <ul style="list-style-type: none"> • Gross profit • Net profit • Net profit transferred to capital <p>3.2 Draw up a statement of financial position with the following sections:</p> <ul style="list-style-type: none"> • Assets: <ul style="list-style-type: none"> – Non-current assets – Current assets • Owner's equity • Liabilities: <ul style="list-style-type: none"> – Non-current liabilities – Current liabilities

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
	3.3 Draw up a statement of cash flow with the following sections: <ul style="list-style-type: none"> • Cash flow from operating activities • Cash flow from investing activities • Cash flow from financing activities • Net increase/decrease in cash
Module 6: Elementary cost and management accounting applications on a spreadsheet 6.1 Cost systems 6.1.1 Draw up a production cost report with the following information: <ul style="list-style-type: none"> • Opening stock • Production cost • Direct material cost • Direct wages • Overheads • Cost of uncompleted work • Cost of stock losses • Total cost Draw up a production cost report with the following columns: Units Cost Unit cost 6.1.2 Draw up an income statement showing the following information: <ul style="list-style-type: none"> • Sales • Cost of sales: <ul style="list-style-type: none"> – Material – Labour • Overheads: <ul style="list-style-type: none"> – Fixed cost – Variable cost • Gross profit • Sales and administration costs • Net profit Use the following columns when drawing up an income statement: Total amount Per unit	Module 4: Basic cost and management accounting applications on a spreadsheet 4. Cost systems 4.1 Draw up a manufacturing cost statement report with the following information: <ul style="list-style-type: none"> • Opening stock • Manufacturing cost <ul style="list-style-type: none"> – Direct material cost – Direct labour – Overheads • Cost of work in process • Cost of stock losses • Total cost Draw up a manufacturing cost report with the following columns: Units Cost Unit Cost 4.2 Draw up a statement of comprehensive income showing the following information: <ul style="list-style-type: none"> • Sales • Cost of production • (Material, labour and overheads) • Gross profit • Sales and administration costs • Net profit

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
	<p>Module 5: Analysis and interpretation of financial statements on a spreadsheet (NEW)</p> <p>5.1 Use of financial statement interpretation</p> <p>5.2 Use data from the financial statements to determine the following:</p> <ul style="list-style-type: none"> • Solvency ratio • Profitability ratios: <ul style="list-style-type: none"> – Gross profit percentage on turnover – Net profit percentage on turnover – Rate of return on owner's equity • Liquidity ratios <ul style="list-style-type: none"> – Acid test ratio – Current ratio – Inventory turnover rate – Trade receivables collection period – Trade payables settlement period – Trade receivables turnover rate <p>Module 6: Financial reports (Report Writer) on an accounting package (Pastel Partner) (NEW)</p> <p>6.1 Setting of the necessary computer parameters for opening a new set of accounts</p> <p>6.2 Setting-up of a general journal with relevant codes and parameters</p> <p>6.3 Creation of general ledger accounts with codes and parameters</p> <p>6.4 Inputting of balances for general ledger accounts</p> <p>6.5 Processing of the general journal and updating to the general ledger</p> <p>6.6 Inputting of standard parameters for the compilation of financial and management reports on a general ledger report writer of an accounting package</p>

Computerised Financial Systems N5

Previous curriculum (1995 curriculum)	New curriculum
	<p>6.7 Preparation and presentation of computerised financial and management reports</p> <p>6.8 Exportation (transfer) of Report Writer data from an accounting package to a spreadsheet</p>
	<p>Module 7: Budgets on an accounting package (Pastel Partner) (NEW)</p> <p>7.1 Setting-up of parameters for a budget system</p> <p>7.2 Inputting of budget items</p> <p>7.3 Percentage adjustments and rounding</p> <p>7.4 Comparison of a budget with actual figures</p> <p>7.5 Exportation (transfer) of budgeted data from an accounting package to a spreadsheet</p>

TVET First authors

T Lakhan & S Mohan

Entrepreneurship and Business Management N5

This document contains important information about the revised curriculum for Entrepreneurship and Business Management N5 for implementation in July 2022.

Overview of main curriculum changes

- **Module 5: Revising, presenting and evaluating the business plan (CHANGED content)**
 - The outcomes that were covered in Module 9 in the 1998 syllabus have moved to Module 5.
- **Module 7: Staffing the business (CHANGED content)**
 - Module 7 covers the content previously addressed in Module 6 in the 1998 syllabus. However, one sub-topic of point 6.2.2 in the old syllabus, 'Physical examination', is not included in the 2022 syllabus.
- **Module 8: Controlling your business (NEW content)**
 - 8.3 Control methods, 8.3.4 Ratio analysis (Financial control): The sub-topic, Profitability ratio, now also includes return on investment (ROI) calculations, in addition to return on assets (ROA).

The 2022 syllabus gives more guidance on evaluation

The semester mark will consist of three components with the following weighted values:

- Assessment 1 (Business plan or practical assignment): 20% [practical component]
- Assessment 2 (Cycle tests): 30% [theoretical component]
- Assessment 3 (Internal examination): 50% [theoretical component].

Entrepreneurship and Business Management N5 syllabus comparison (1998 and 2022)

The comparison that follows sets out the changes that have been made to the EBM N5 syllabus, with the 2022 syllabus presented in the right-hand column of the table and the relevant outcomes from the 1998 syllabus for EBM N5 in the left-hand column. Changes have been marked in **RED** for ease of reference.

Previous curriculum (1998 syllabus)	New curriculum
Module 1: Introduction to management (weighted value of 9%)	Module 1: Introduction to management (weighted value of 9%)
1.1 Introduction	1.1 Introduction
1.1.1 The meaning of management	1.1.1 The meaning of management
1.1.2 Types of organisational resources: <ul style="list-style-type: none"> • Human resources • Financial resources • Physical resources • Technological resources 	1.1.2 Types of organisational resources: <ul style="list-style-type: none"> • Human resources • Financial resources • Physical resources • Technological resources

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Previous curriculum (1998 syllabus)	New curriculum
<p>1.1.3 The importance of management</p> <p>1.1.4 The skills of a manager:</p> <ul style="list-style-type: none"> • Technical skills • Human skills • Conceptual skills <p>1.1.5 Characteristics of managers</p> <p>1.2 Responsibilities of managers</p> <p>1.2.1 Primary responsibility of the different levels of managers:</p> <ol style="list-style-type: none"> a) Top level b) Middle level c) Lower level <p>1.2.2 Functional responsibilities of managers:</p> <ol style="list-style-type: none"> a) Finance b) Marketing c) Personnel d) Production <p>1.3 The management environment</p> <p>1.3.1 Internal:</p> <ul style="list-style-type: none"> • Formal organisation • Informal organisation • Organisational politics <p>1.3.2 External environment:</p> <ul style="list-style-type: none"> • Direct external: <ul style="list-style-type: none"> – Customers – Suppliers – Competition – Government • Indirect external: <ul style="list-style-type: none"> – Economic – Political – Social – Cultural – Environmental – Technological – International <p>1.4 Task: Select one indirect external environment and determine how it influences your proposed business plan.</p>	<p>1.1.3 The importance of management</p> <p>1.1.4 The skills of a manager:</p> <ul style="list-style-type: none"> • Technical skills • Human skills • Conceptual skills <p>1.1.5 Characteristics of managers</p> <p>1.2 Responsibilities of managers</p> <p>1.2.1 Primary responsibility of the different levels of managers:</p> <ol style="list-style-type: none"> a) Top level b) Middle level c) Lower level <p>1.2.2 Functional responsibilities of managers:</p> <ol style="list-style-type: none"> a) Finances b) Marketing c) Personnel d) Production <p>1.3 The management environment</p> <p>1.3.1 Internal environment:</p> <ul style="list-style-type: none"> • Formal organisation • Informal organisation • Organisational politics <p>1.3.2 External environment:</p> <ul style="list-style-type: none"> • Direct external: <ul style="list-style-type: none"> – Customers – Suppliers – Competition – Government • Indirect external: <ul style="list-style-type: none"> – Economic – Political – Social – Cultural – Environmental – Technological – International <p>1.4 Task: Select one indirect external environment and determine the influence of it on your proposed business plan.</p>

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Previous curriculum (1998 syllabus)	New curriculum
Module 2: Personal management (weighted value of 8%)	Module 2: Personal management (weighted value of 8%)
2.1 Introduction	2.1 Introduction
2.1.1 Management and leading	2.1.1 Management and leading
2.2 Personal management	2.2 Personal management
2.2.1 The role of habits	2.2.1 The role of habits
2.2.2 Seven habits for effective self-management: <ul style="list-style-type: none"> a) Pro-activeness b) Begin with the end in mind: <ul style="list-style-type: none"> • Defining a personal mission statement c) Determining priorities d) The paradigms of human interaction: <ul style="list-style-type: none"> • The win/win situation e) The other point of view: <ul style="list-style-type: none"> • The art of listening f) Synergising g) Personal motivation: <ul style="list-style-type: none"> • Social/emotional circumstances • Mental stimulation • Physical development • Spiritual development 	2.2.2 Seven habits for effective self-management: <ul style="list-style-type: none"> a) Pro-activeness b) Begin with the end in mind: <ul style="list-style-type: none"> • Defining a personal mission statement c) Determining priorities d) The paradigms of human interaction: <ul style="list-style-type: none"> • The win/win combination e) The other point of view: <ul style="list-style-type: none"> • The art of listening f) Synergising g) Personal motivation: <ul style="list-style-type: none"> • Social/emotional circumstances • Mental stimulation • Physical development • Spiritual development
2.3 Personal planning	2.3 Personal planning
2.3.1 Time management	2.3.1 Time management: <ul style="list-style-type: none"> • Personal/manager roles • Effective planning system
2.3.2 Task: <ul style="list-style-type: none"> a) Complete the questionnaire to determine the student's urgent/important orientation. b) Identify different private and business roles. c) Complete one weekly planning sheet of students' day-to-day activities given their own roles. 	2.3.2 Task: <ul style="list-style-type: none"> a) Complete the questionnaire to determine the students' urgent/important orientation. b) Identify different private and business roles. c) Complete one weekly planning sheet of students' day-to-day activities given their own roles.
2.4 Motivating your workforce	2.4 Motivating your workforce
2.4.1 Methods to implement motivation	2.4.1 Methods of implementing motivation

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Previous curriculum (1998 syllabus)	New curriculum
<p>2.4.2 Importance of motivating your workforce</p> <p>2.5 Teamwork</p> <p>2.5.1 Team building</p> <p>2.5.2 Group dynamics</p>	<p>2.4.2 Importance of motivating your workforce</p> <p>2.5 Teamwork</p> <p>2.5.1 Team building</p> <p>2.5.2 Group dynamics</p>
<p>Module 3: Ethics and social responsibilities of a business (weighted value of 8%)</p> <p>3. Ethics and social responsibilities</p> <p>3.1 The meaning of ethics and the social responsibilities of a business</p> <p>3.2 Ethics and the social responsibilities of the entrepreneur</p> <p>3.2.1 An ethical perspective:</p> <ul style="list-style-type: none"> • The law • The policies and procedures of the business • The moral stance <p>3.3 Ethical standards</p> <p>3.3.1 Establishing ethical standards:</p> <ul style="list-style-type: none"> • Utilitarian principle • Professional ethics • The golden rule • Television and family test <p>3.3.2 Maintaining ethical standards</p> <p>3.4 Social responsibility</p> <p>3.4.1 Views of social responsibilities:</p> <ul style="list-style-type: none"> • Profit-centred • Regulation-imposed • Investment-earned <p>3.4.2 The responsibilities of a business to the:</p> <ul style="list-style-type: none"> • Environment • Employees • Customers • Community <p>3.5 Task: Evaluate a business's social responsibility programme according to the criteria</p>	<p>Module 3: Ethics and social responsibilities of a business (weighted value of 8%)</p> <p>3. Ethics and social responsibilities</p> <p>3.1 The meaning of ethics and the social responsibilities of a business</p> <p>3.2 Ethics and the social responsibilities of an entrepreneur</p> <p>3.2.1 An ethical perspective:</p> <ul style="list-style-type: none"> • The law • The policies and procedures of the business • The moral stance <p>3.3 Ethical standards</p> <p>3.3.1 Establishing ethical standards:</p> <ul style="list-style-type: none"> • Utilitarian principle • Professional ethics • The golden rule • Television and family test <p>3.3.2 Maintaining ethical standards</p> <p>3.4 Social responsibility</p> <p>3.4.1 Views of social responsibilities:</p> <ul style="list-style-type: none"> • Profit-centred • Regulation-imposed • Investment-earned <p>3.4.2 The responsibilities of a business to the:</p> <ul style="list-style-type: none"> • Environment • Employees • Customers • Community <p>3.5 Task: Evaluate a business's social responsibility programme according to the criteria.</p>

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Previous curriculum (1998 syllabus)	New curriculum
<p>Module 4: Implementation of planning in your business plan (weighted value of 7%)</p> <p>4.1 Introduction</p> <p>4.1.1 Mission statement for a business plan</p> <p>4.1.1.1 Characteristics of a mission statement:</p> <ul style="list-style-type: none"> • Establish identity of a company • Define business • Relevant to business's stakeholders • Exciting and inspiring <p>4.1.2 The establishment of long-term objectives: specific, measurable, achievable, written, comprehensive, coordinated, prioritised, time-bound, flexible, accepted</p> <p>4.2 Business level planning According to the different functions within a business</p> <p>4.2.1 Finance:</p> <ul style="list-style-type: none"> • Definition of the finance function • Type of financial information • Purpose of finance <p>4.2.2 Marketing:</p> <ul style="list-style-type: none"> • Definition of the marketing function • Nature of market planning <p>4.2.3 Production (operations management):</p> <ul style="list-style-type: none"> • Definition of the production function • Nature of production planning <p>4.2.4 Personnel:</p> <ul style="list-style-type: none"> • Definition of the personnel function • Nature of personnel planning <p>4.2.5 Task: Adaption of the business plan, given the mission statement and objectives</p>	<p>Module 4: Implementation of planning in the business plan (weighted value of 7%)</p> <p>4. Introduction</p> <p>4.1 Mission statement of a business plan</p> <p>4.1.1 Characteristics of a mission statement:</p> <ul style="list-style-type: none"> • Establish identity of company • Define business • Relevant to business's stakeholders • Exciting and inspiring <p>4.1.2 The establishment of long-term objectives that are specific, measurable, achievable, written, comprehensive, coordinated, prioritised, time-bound, flexible and accepted</p> <p>4.2 Business level planning according to the different functions within a business</p> <p>4.2.1 Finance:</p> <ul style="list-style-type: none"> • Definition of the finance function • Type of financial information • Purpose of finance <p>4.2.2 Marketing:</p> <ul style="list-style-type: none"> • Definition of the marketing function • Nature of marketing planning <p>4.2.3 Production (operations management):</p> <ul style="list-style-type: none"> • Definition of the production function • Nature of production planning <p>4.2.4 Personnel:</p> <ul style="list-style-type: none"> • Definition of the personnel function • Nature of personnel planning <p>4.2.5 Task: Adaption of the business plan, given the mission statement and objectives</p>

Entrepreneurship and Business Management N5

Previous curriculum (1998 syllabus)	New curriculum
<p>4.3 Managerial decision-making</p> <p>4.3.1 Types of decisions</p> <p>4.3.2 Decision styles:</p> <ul style="list-style-type: none"> ● Centralised decisions ● Decentralised decisions ● Participative decisions <p>4.3.3 Personal influences on decision styles:</p> <ul style="list-style-type: none"> ● Impulsiveness ● Overcautiousness ● Ego-defensive ● Intelligence <p>4.4 The decision-making process:</p> <ul style="list-style-type: none"> ● Problem awareness ● Definition of the problem ● Establish decision criteria ● Develop alternative solutions ● Analyse the data ● Decide or take action ● Make follow-up decisions <p>4.5 Techniques:</p> <ul style="list-style-type: none"> ● Develop alternative solutions and stimulate creativeness: <ul style="list-style-type: none"> – Generation of alternatives – Reverse method – Brainstorming – Challenge assumptions – The 'why' technique – Suspended judgement – Fractioning 	<p>4.3 Managerial decision making</p> <p>4.3.1 Types of decisions</p> <p>4.3.2 Decision styles</p> <ul style="list-style-type: none"> ● Centralised decisions ● Decentralised decisions ● Participative decisions <p>4.3.3 Personal influences on decision styles</p> <p>4.4 The decision-making process:</p> <ul style="list-style-type: none"> ● Problem awareness ● Definition of the problem ● Establish decision criteria ● Develop alternative solutions ● Analyse the data ● Decide or take action ● Make follow-up decision <p>4.5 Techniques:</p> <ul style="list-style-type: none"> ● Generation of alternatives ● Reverse method ● Brainstorming ● Challenge assumptions ● The 'why' technique ● Suspended judgement ● Fractioning
<p>Module 9: Revising, presenting and evaluating the business plan (weighted value of 15%)</p> <p>9. Completion of business plan</p> <p>9.1 Appendix of supporting materials:</p> <ul style="list-style-type: none"> ● Credit reports ● Reference letter ● Legal documents ● Resumes ● Copies of contracts and leases <p>9.2 Adapt the business plan</p>	<p>Module 5: Revising, presenting and evaluating the business plan (weighted value of 15%)</p> <p>5. Completion of business plan</p> <p>5.1 Appendix of supporting materials:</p> <ul style="list-style-type: none"> ● Credit reports ● Reference letters ● Legal documents ● Resumes ● Copies of contracts and leases <p>5.2 Adapt the business plan to a format that is presentable</p>

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Previous curriculum (1998 syllabus)	New curriculum
9.3 Present the business plan	5.3 Present the business plan for a practical mark
9.4 Evaluate the adapted business plan	5.4 Evaluate the adapted business plan according to the evaluation forms with the emphasis on the managerial components
Module 5: Organising the business (weighted value of 9%) <p>5.1 Introduction</p> <p>5.1.1 The division of work into jobs:</p> <ul style="list-style-type: none"> • Job generalisation • Job specification <p>5.2 Forming of an organisational structure</p> <p>5.2.1 Types of organisational structures</p> <p>5.2.2 Departmentation as an example of an organisational structure:</p> <ul style="list-style-type: none"> • Function • Product • Customer • Process • Territorial • Time <p>5.2.3 Task: Design an organisational structure according to your business plan.</p> <p>5.3 Delegation</p> <p>5.3.1 Authority in an organisation:</p> <ul style="list-style-type: none"> • The right to act • Entitlement to act • Provides the power to apply <p>5.3.2 Power:</p> <ul style="list-style-type: none"> • Position power • Personal power • Subordinate power <p>5.3.3 The delegation process:</p> <ul style="list-style-type: none"> • Assign tasks (responsibility) • Grant authority • Obligation (accountability) 	Module 6: Organising the business (weighted value of 9%) <p>6.1 Introduction</p> <p>6.1.1 The division of work into jobs:</p> <ul style="list-style-type: none"> • Job generalisation • Job specification <p>6.2 Forming of an organisational structure</p> <p>6.2.1 Types of organisational structures</p> <p>6.2.2 Departmentation as an example of an organisational structure:</p> <ul style="list-style-type: none"> • Function • Product • Customer • Process • Territorial • Time <p>6.2.3 Task: Design an organisational structure according to your business plan.</p> <p>6.3 Delegation</p> <p>6.3.1 Authority in an organisation:</p> <ul style="list-style-type: none"> • The right to act • Entitlement to act • Provides the power to apply <p>6.3.2 Power:</p> <ul style="list-style-type: none"> • Position power • Personal power • Subordinate power <p>6.3.3 The delegation process:</p> <ul style="list-style-type: none"> • Assign tasks (responsibility) • Grant authority • Obligation (accountability)

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Previous curriculum (1998 syllabus)	New curriculum
<p>5.3.4 Creating a delegation environment:</p> <ol style="list-style-type: none"> Condition How to delegate effectively Behavioural aspects of delegation <p>5.4 Task: Identify the pitfalls of delegation and indicate how they can be avoided.</p>	<p>6.3.4 Creating a delegation environment:</p> <ul style="list-style-type: none"> Condition How to delegate effectively Behavioural aspects of delegation <p>6.4 Task: Identify the pitfalls of delegation and indicate how they can be avoided.</p>
<p>Module 6: Staffing the business (weighted value of 11%)</p> <p>6.1 Introduction</p> <p>6.1.1 The importance of people in a business</p> <p>6.2 Human resources planning</p> <p>6.2.1 Recruitment of workers:</p> <ul style="list-style-type: none"> Job analysis Job description Job specifications <p>6.2.2 Selecting the most qualified employees:</p> <ul style="list-style-type: none"> Applications Initial interview Psychological tests Employment interview Approval by supervisor Physical examination Induction or orientation <p>6.3 Job design</p> <p>6.3.1 Factors that affect job design</p> <p>6.3.2 Job enlargement: Additional responsibilities on a horizontal level</p> <p>6.3.3 Job enrichment</p> <p>6.4 Job description</p> <p>6.4.1 The importance of a job description</p> <p>6.4.2 Essential components:</p> <ul style="list-style-type: none"> Job identification Job summary Duties to be performed Supervision given and received Relation to other jobs Machines, tools and other materials Working conditions 	<p>Module 7: Staffing the business (weighted value of 11%)</p> <p>7.1 Introduction</p> <p>7.1.1 The importance of people in a business.</p> <p>7.2 Human resources planning</p> <p>7.2.1 Recruitment of workers:</p> <ul style="list-style-type: none"> Job analysis Job descriptions Job specifications <p>7.2.2 Selecting the best qualified employees:</p> <ul style="list-style-type: none"> Applications Initial interview Psychological tests Employment interview Approval by supervisor Induction or orientation <p>7.3 Job design</p> <p>7.3.1 Factors that affect job design</p> <p>7.3.2 Job enlargement: Additional responsibilities on a horizontal level</p> <p>7.3.3 Job enrichment</p> <p>7.4 Job description</p> <p>7.4.1 The importance of job descriptions</p> <p>7.4.2 Essential components:</p> <ul style="list-style-type: none"> Job identification Job summary Duties to be performed Supervision given and received Relation to other jobs Machines, tools and other materials Working conditions

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Previous curriculum (1998 syllabus)	New curriculum
<ul style="list-style-type: none"> • Definition of unusual terms • Comments to add <p>6.4.3 Task: Write a job description for one employee according to your business plan; update your business plan.</p> <p>6.5 Training and development</p> <p>6.5.1 The value of training and development</p> <p>6.5.2 Needs of a development program:</p> <ul style="list-style-type: none"> • Decision-making skills • Interpersonal skills • Job knowledge • Knowledge of the organisation • General knowledge • Specific individual needs <p>6.6 Performance appraisals</p> <p>6.6.1 Process:</p> <ul style="list-style-type: none"> • Goal setting • Implementation and review • Performance appraisal <p>6.7 Compensation</p> <p>6.7.1 Compiling a salary package:</p> <ul style="list-style-type: none"> • How to reach a decision on paying a specific wage • Legal aspects, specifically UIF and Basic Conditions of Employment Act • PAYE and SITE • Possible fringe benefit options to a business • By whom and how the minimum wage is determined <p>6.8 Labour relations</p> <p>6.8.1 Trade unions</p> <p>6.8.2 Collective bargaining</p> <p>6.8.3 Labour legislation:</p> <ul style="list-style-type: none"> • Labour Relations Act • Basic Conditions of Employment Act • Workmen's Compensation Act • Unemployment Insurance Fund 	<ul style="list-style-type: none"> • Definition of unusual terms • Comments to add <p>7.4.3 Task: Write a job description for one employee according to your business plan. Update your business plan.</p> <p>7.5 Training and development</p> <p>7.5.1 The value of training and development</p> <p>7.5.2 Needs of a development program:</p> <ul style="list-style-type: none"> • Decision-making skills • Interpersonal skills • Job knowledge • Knowledge of the organisation • General knowledge • Specific individual needs <p>7.6 Performance appraisals</p> <p>7.6.1 Process:</p> <ul style="list-style-type: none"> • Goal setting • Implementation and review • Performance appraisal <p>7.7 Compensation</p> <p>7.7.1 Compiling a salary package:</p> <ul style="list-style-type: none"> • How to reach a decision on paying a specific wage • Legal aspects, specifically UIF and Basic Conditions of Employment Act • PAYE and SITE • Possible fringe benefit options to a business • By whom and how the minimum wage is determined <p>7.8 Labour relations</p> <p>7.8.1 Trade unions</p> <p>7.8.2 Collective bargaining</p> <p>7.8.3 Labour legislation:</p> <ul style="list-style-type: none"> • Labour Relations Act • Basic Condition of Employment Act • Workmen's Compensation Act • Unemployment Insurance Fund

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Previous curriculum (1998 syllabus)	New curriculum
<p>6.9 Task:</p> <ol style="list-style-type: none"> Students must list the criteria of acceptability for a specific position in their business. These criteria can be used during the evaluation of applicants. Students must compile a list of legislation applicable to their type of business and determine the possible cost aspect of this. 	<p>7.9 Task:</p> <ol style="list-style-type: none"> Students must list the criteria of acceptability for a specific position in their business. These criteria can be used during the evaluation of applicants. Students must compile a list of legislation applicable to their type of business and describe the possible cost aspect of this.
<p>Module 7: Controlling your business (weighted value of 18%)</p> <p>7.1 Introduction</p> <p>7.1.1 The nature of control</p> <p>7.1.2 Characteristics of effective control:</p> <ul style="list-style-type: none"> • Timeliness • Effective organisational structure • Strategic placement • Cost-effective action • Periodic evaluation of trends <p>7.2 Control chart</p> <p>7.2.1 Steps in the control process (managing ineffective performance):</p> <ul style="list-style-type: none"> • Measure current performance in relation to established standards • Inform subordinate and jointly formulate a diagnosis • Select remedial activity or intervention • Re-evaluate performance after time interval • Continue or discontinue remedial action <p>7.3 Control methods</p> <p>7.3.1 Termination of employment</p> <p>7.3.2 Budgeting</p> <p>7.3.3 Zero-based budgeting (justify all expenses from scratch)</p>	<p>Module 8: Controlling your business (weighted value of 18%)</p> <p>8.1 Introduction</p> <p>8.1.1 The nature of control</p> <p>8.1.2 Characteristics of effective control:</p> <ul style="list-style-type: none"> • Timeliness • Effective organisational structure • Strategic placement • Cost-effective action • Periodical evaluation of trends <p>8.2 Control chart</p> <p>8.2 Steps in the control process (managing ineffective performance):</p> <ul style="list-style-type: none"> • Measure current performance in relation to established standards • Inform subordinate and jointly formulate a diagnosis • Select remedial activity or intervention • Re-evaluate performance after time interval • Continue or discontinue remedial action <p>8.3 Control methods</p> <p>8.3.1 Termination of employment</p> <p>8.3.2 Budgeting</p> <p>8.3.3 Zero-based budgeting (justify all expenses from scratch)</p>

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Previous curriculum (1998 syllabus)	New curriculum
<p>7.3.4 Ratio analysis (financial control):</p> <ol style="list-style-type: none"> Profitability ratios: <ul style="list-style-type: none"> Return on assets Liquidity ratios: <ul style="list-style-type: none"> Current ratio Acid-test ratio Accounts receivable over turnover ratio Inventory turnover ratio <p>7.3.5 Break-even point: Equation method</p> <ul style="list-style-type: none"> Sales = Variable expense + Fixed expenses + Profits Break-even: Profit = zero <p>7.3.6 Control of technology:</p> <ul style="list-style-type: none"> Computers Facsimile machines Telephones Cellular phones Photocopiers <p>7.3.7 Stock control:</p> <ol style="list-style-type: none"> Types of inventory: <ul style="list-style-type: none"> Raw materials Work in progress Finished products Inventory control policy: <ul style="list-style-type: none"> Quantities Re-order point Inventory that warrants special attention Inventory costs: <ul style="list-style-type: none"> Purchasing costs Ordering costs Carrying costs Economical order quantity Size of safety stock: <ul style="list-style-type: none"> Uncertainty in demand forecasting Probability of delays from suppliers Lead times of suppliers Costs of safety stock <p>7.3.8 Credit control:</p> <ol style="list-style-type: none"> Credit policy: <ul style="list-style-type: none"> Credit period 	<p>8.3.4 Ratio analysis (financial control):</p> <ol style="list-style-type: none"> Profitability ratios: <ul style="list-style-type: none"> Return on assets (ROA) Return on investment Liquidity ratios: <ul style="list-style-type: none"> Current ratio Acid test ratio Accounts receivable turnover ratio Inventory turnover ratio <p>8.3.5 Break-even point: Equation method</p> <ul style="list-style-type: none"> Sales = Variable expenses + Fixed expenses + Profits Break-even point: Profit = zero <p>8.3.6 Control of technology:</p> <ul style="list-style-type: none"> Computers Facsimile machines Telephones Cellular phones Photocopiers <p>8.3.7 Stock control:</p> <ol style="list-style-type: none"> Types of inventory: <ul style="list-style-type: none"> Raw material Work in progress Finished products Inventory control policy: <ul style="list-style-type: none"> Quantities Re-order point Inventory that warrants special attention Inventory costs: <ul style="list-style-type: none"> Purchasing costs Ordering costs Carrying costs Economic order quantity Size of safety stock: <ul style="list-style-type: none"> Uncertainty in demand forecasting Probability of delays from suppliers Lead times of suppliers Costs of safety stock <p>8.3.8 Credit control:</p> <ol style="list-style-type: none"> Credit policy: <ul style="list-style-type: none"> Credit period

Entrepreneurship and Business Management N5

Previous curriculum (1998 syllabus)	New curriculum
<ul style="list-style-type: none"> • Credit standards of clients • Collection policy • Discounts for early payments <p>b) Cost of credit:</p> <ul style="list-style-type: none"> • Recordkeeping • Tied-up capital • Bad debts • Lost interest • Follow-up costs <p>7.4 Tasks:</p> <p>a) Use the technique of zero-based budgeting and budget for a specific project.</p> <p>b) Determine the break-even point of the proposed business plan. It will require research into various aspects of the business.</p> <p>c) Include the information acquired in your business plan.</p>	<ul style="list-style-type: none"> • Credit standards of clients • Collection policy • Discounts for early payment <p>b) Cost of credit:</p> <ul style="list-style-type: none"> • Recordkeeping • Tied-up capital • Bad debts • Lost interest • Follow-up costs <p>8.4 Task:</p> <p>a) Use the technique of zero-based budgeting and budget for a specific project.</p> <p>b) Determine the break-even point of the proposed business plan. It will require research into various aspects of the business.</p> <p>c) Include the information acquired in your business plan.</p>
<p>Module 8: Operations management (weighted value of 15%)</p> <p>8.1 The nature of operations management:</p> <ul style="list-style-type: none"> • Inputs • Transformation process (creation of value) • Outputs <p>8.2 Designing operations systems</p> <p>8.2.1 Products and services:</p> <ul style="list-style-type: none"> • Design and specifications of Products and services <p>8.2.2 Capacity:</p> <ul style="list-style-type: none"> • Determining capacity • Best operating level • Economies of scale • Capacity balance (bottlenecks) <p>8.2.3 Facilities:</p> <ul style="list-style-type: none"> • Design and specification of process • Location of facilities • Layout of facilities and resources <p>8.2.4 Technology:</p> <ul style="list-style-type: none"> • Definition 	<p>Module 9: Operations management (weighted value of 15%)</p> <p>9.1 The nature of operations management:</p> <ul style="list-style-type: none"> • Inputs • Transformation process (creation of values) • Outputs <p>9.2 Designing operations systems</p> <p>9.2.1 Products and services:</p> <ul style="list-style-type: none"> • Design and specifications of products and services <p>9.2.2 Capacity:</p> <ul style="list-style-type: none"> • Determining capacity • Best operating level • Economies of scale • Capacity balance (bottlenecks) <p>9.2.3 Facilities:</p> <ul style="list-style-type: none"> • Design and specification of process • Location of facilities • Layout of facilities and resources <p>9.2.4 Technology:</p> <ul style="list-style-type: none"> • Definition

Entrepreneurship and Business Management N5

Previous curriculum (1998 syllabus)	New curriculum
8.3 Using operations systems 8.3.1 Operation management control: <ul style="list-style-type: none"> • Scheduling of activities • Controlling and planning inventories • Control of quality • Scheduling and controlling maintenance • Performance measurements • Key facets of production control: • Estimating costs • Estimating delivery times • Deciding on start and finishing time • Control statements 8.3.2 Purchasing management: <ul style="list-style-type: none"> • Characteristics • Suppliers • Quantities • Quality • Transport 8.3.3 Inventory management: <ul style="list-style-type: none"> • Inventory control 8.4 Managing productivity: <ul style="list-style-type: none"> • Influences on productivity: <ul style="list-style-type: none"> – Employees – Management – Raw materials – Operations – Market conditions 8.5 Managing quality: <ul style="list-style-type: none"> • Basic requirements of a quality control system • Costs of quality 8.6 Task: Students must refer to their business plan and compile a purchasing plan to cover the aspects that a manager should keep in mind.	9.3 Using operations systems 9.3.1 Operation management control: <ul style="list-style-type: none"> • Scheduling of activities • Controlling and planning inventories • Control of quality • Scheduling and controlling maintenance • Performance measurements • Key facets of production control: • Estimating costs • Estimating delivery times • Deciding on start and finishing time • Control statements 9.3.2 Purchasing management: <ul style="list-style-type: none"> • Characteristics • Suppliers • Quantities • Quality • Transport 9.3.3 Inventory management: <ul style="list-style-type: none"> • Inventory control 9.4 Managing productivity and influences on productivity: <ul style="list-style-type: none"> • Employees • Management • Raw materials • Operations • Market conditions 9.5 Managing quality: <ul style="list-style-type: none"> • Basic requirements of a quality control system • Costs of quality 9.6 Task: Students must refer back to their business plan and compile or update their purchasing plan to cover the aspects mentioned that a manager should keep in mind.

TVET First author

A Janse van Rensburg

Travel Services N6

This document contains important information about the revised curriculum for Travel Services N6 for implementation in 2021.

The main changes to this syllabus

- Students may now take **textbooks and notes** into the examination.
- A **new module** on events management has been added to the syllabus.
- The module on hotel reservations has been **removed**.
- The **weighting** of the new module is split as shown in the table that follows.

Module	Weighting
1. Events management	12
2. Car hire	14 (was 11%)
3. Foreign currency	20 (was 18%)
4. Travel insurance	12
5. Special international travel (rail, ferry and cruise)	12
6. Tour planning and budgeting	30 (was 36%)
Total	100

- **Duration:** One hour of the seven hours per week must now be allocated to a practical exercise, an industry visit, a presentation by a guest lecturer or a case study.
- **Assessment components:** Instead of three formal tests of at least 100 marks, there must now be one assignment (20%), one test (30%) and one internal examination (50%), which must be averaged out to a mark out of 30.
- **Semester marks:** A semester mark of 70% is now required in order to sit the examination (previously, this was 60%).
- **Examinations:**
 - Written assessment must include various cognitive skills listed in Bloom's taxonomy. A prescribed weighting for each of these skills is presented in the table that follows.

Recall	Application	Analysis	Synthesis	Evaluation
20-30	20-25	20-25	15-25	10-15

- Pass requirements:
 - The examination is one three-hour paper divided into Paper 1 and Paper 2 for a total of 200 marks.
 - **Paper 1** (previously Section A) is a **closed-book examination** and all questions are compulsory. This paper is now worth 80 marks (it was previously worth 40 marks).
 - **Paper 2** (previously Section B) is an **open-book examination**, which means that students may bring **textbooks, notes, GSA, a calendar and a pocket calculator** into the examination venue. Three out of the four questions are compulsory and this examination is now worth 120 marks (previously four out of the five questions were compulsory and the examination was worth 160 marks).

Travel Services N6

- **General information:** Industry exposure for lectures and the students is compulsory (WIL/WBE). It is recommended that Travel Services be offered in a computer lab where possible.
- **Experiential learning:** A relevant logbook attainable at the college must be used for experiential learning.

Travel Services N6 syllabus

The table that follows sets out the changes that have been made to the TS N6 syllabus. We explain how the previous curriculum has been revised in the left-hand column and list the new content in the righthand column.

How the previous curriculum has changed	New and revised learning content and learning outcomes in 2021 curriculum
Module 1: Events management (NEW) <ul style="list-style-type: none"> • This module is brand new. • Weighting: 12%. 	Module 1: Events management <ol style="list-style-type: none"> 1. Mega and major tourism events <ol style="list-style-type: none"> 1.1 Understand the concepts of mega and major events within the tourism context (national and international events industry e.g. soccer, cricket, rugby world cups). 2. Impacts of events in the economy <ol style="list-style-type: none"> 2.1 Understand the impact of events on the local and national economy. 3. Life cycle of events industry <ol style="list-style-type: none"> 3.1 Understand the life cycle of events industry past, present and future (big events in SA). 4. Events management <ol style="list-style-type: none"> 4.1 Identify, explain and organise the different context of events management (quality requirements to ensure success, good teamwork and communication skills, logistic management). 5. Sustainable impact on tourism business and sourcing out information both events and tourist attraction <ol style="list-style-type: none"> 5.1 Identify events that could sustainably have an impact on a tourism business (collect information from news reports on current events and identify their impact on the tourism industry).

Travel Services N6

How the previous curriculum has changed	New and revised learning content and learning outcomes in 2021 curriculum
	<p>5.2 Source information on major events and tourist attractions in local area (annual event calendar, attractions where tourists can go to before and after).</p> <p>6. Facilities and services for events</p> <p>6.1 Identify the required facilities and services in planning a successful event.</p> <p>7. Local municipality regulations</p> <p>7.1 Understand the importance of adhering to local government regulations when planning an event (permits, legislation and regulations).</p>
<p>Module 2: Car hire</p> <ul style="list-style-type: none"> Was Module 1 Weighting: 14% (was 11%). Learning content on procedure has been moved into the section on tariffs and the order has been rearranged slightly. The syllabus now prescribes services and facilities offered, points that need to be discussed and a list of terms that are commonly used Content on e-vouchers has been added to the section on documentation (LC 3). Content on international bookings and payments has been removed. 	<p>Module 2: Car hire</p> <p>1. Tariffs</p> <p>1.1 Explain the services and facilities generally offered by large car hire companies in terms of the following:</p> <ul style="list-style-type: none"> Car hire Chauffeur drive Point to point/transfers Van rental and truck hire <p>1.2 State the points that need to be discussed with a client e.g.</p> <ul style="list-style-type: none"> One day = 24 hours Collection/delivery charge Pick-up and drop-off One-way rental fee Tourism levy Grace period Contract fee Additional driver Car codes <p>1.4 Given a list of terms commonly used in respect of car hire tariffs. Briefly explain the meaning of these terms:</p> <ul style="list-style-type: none"> Corporate rates VIPCO – specifically tailored for a company, especially if they will use only one particular car hire company Discretionary rates – for travel agents where they can earn commission

Travel Services N6

How the previous curriculum has changed	New and revised learning content and learning outcomes in 2021 curriculum
	<ul style="list-style-type: none"> Travel industry rates – for industry colleagues Weekend special rates Monthly rates Rates are linked to kilometres e.g. 100 km p/day, 200 km p/day, unlimited kilometres etc. <p>3. Documentation</p> <p>3.1 Complete the appropriate car hire voucher/e-voucher accurately and neatly according to the instructions of the car rental company.</p>
<p>Module 3: Foreign currency</p> <ul style="list-style-type: none"> Was Module 2. Weighting: 20% (was 18%). LC 1: <ul style="list-style-type: none"> The following learning outcome has been removed: 'Quote, without having to consult any guide, the foreign travel allowance.' A learning outcome relating to international currency codes has been added. LC 2 ('Clients' travel documents') has been added and 'Ways of carrying money overseas' has been moved to LC 3. An extra learning outcome has been added to 'Ways of carrying money overseas'. 'Buying and selling foreign currency' has changed to LC 4: 'Banks and regulations of foreign currency'. <ul style="list-style-type: none"> An extra learning outcome has been added on banks able to do foreign exchange. Five learning outcomes relating to the completion of forms have been removed. 'Exchange rate' is now LC 5. 	<p>Module 3: Foreign currency</p> <p>1. Foreign travel allowance</p> <p>1.2 Identify the international currency codes of the world.</p> <p>2. Clients' travel documents</p> <p>2.1 Quoting and consulting travel clients with documents that are in line with their foreign travel allowance (adults as well as children).</p> <p>3. Ways of carrying money overseas</p> <p>3.2 Demonstrate the ability to advise tourists on the safe and legal ways of carrying money in different countries.</p> <p>4. Banks and regulations of foreign currency</p> <p>4.2 Provide a list of banks that are able to provide foreign exchange for foreign countries.</p>
<p>Module 4: Travel insurance</p> <ul style="list-style-type: none"> Weighting: 12%. 	

Travel Services N6

How the previous curriculum has changed	New and revised learning content and learning outcomes in 2021 curriculum
<ul style="list-style-type: none"> The following learning outcome has been removed from LC 1 ('Packages and options'): 'List eventualities covered by travel insurance policies as well as automatic insurance when a client pays for air travel with a bank credit card.' The section on Motor home/camper packages has been completely removed. 	
<p>Module 5: Special international travel (rail, ferry and cruise)</p> <ul style="list-style-type: none"> Was Module 4 Weighting: 12%. The Thomas Cook Continental Timetable has been replaced with the Eurail timetable. The following content has been added: <ul style="list-style-type: none"> Quoting agency commission Advantages of cruising and procedures for booking. The following content has been removed: <ul style="list-style-type: none"> Explain the procedure to book a rail reservation with the local General Sales Agent (GSA). Given a case study, read and interpret cruise brochures correctly and recommend a cruise and select a cabin on a specific deck to suit the needs of a client. Complete the cruise reservation form accurately, using the client profile and cruise brochure. 	<p>Module 5: Special international travel (rail, ferry and cruise)</p> <p>4. Rail and ferry timetable, cruise brochure</p> <p>4.4 Given the relevant timetable/brochure extracts, quote fares accurately and quote agency commission.</p> <p>4.5 State the advantages of cruising and the procedures for booking a cruise.</p>
<p>Module 6: Tour planning and budgeting</p> <ul style="list-style-type: none"> Remains as Module 6 Weighting: 30% (was 36%). The IATA resolution required has changed from 870 to 800. Learning content on inclusive tours has been added. Learning content on IT and GIT fares manuals has been removed. Learning content on IT and GIT fare costs has been added. 	<p>Module 6: Tour planning and budgeting</p> <p>5. Inclusive tours</p> <p>5.1 Explain the term 'inclusive tour'.</p> <p>5.2 Explain different types of tours.</p> <p>6. IT and GIT fares</p> <p>6.2 State costs for individual IT and GIT fares.</p>

Travel Services N6

Features of *TVET First Travel Services N5*

The series has been fully updated and is aligned with the new 2021 curriculum. It was written and updated by lecturers with more than 20 years of experience in the industry and in lecturing.

The Student's Book has the following features:

- Many examples to help students understand and apply the correct techniques.
- Step-by-step methods to aid explanations.
- Case studies with real-life situations to help students apply concepts.
- Tables, bulleted lists and images to aid with explanation and increase readability.
- Starter activities to stimulate discussion.
- Summaries at the end of each module, which are indispensable tools for revision and examination preparation.
- Clear highlighting and explanation of important terminology to help students understand difficult concepts and overcome language barriers.
- Tips to help students remember key points as they revise for examinations.
- 'See it online' links providing access to online resources and research sites to further students' knowledge of key concepts.
- Activities based on real-life situations with blank forms to allow students to practise applying the correct techniques.
- Examination-type summative assessments at the end of each module, which are indispensable tools for revision and examination preparation.
- Activities with car hire travel vouchers, referral vouchers and travel insurance policy forms so that students can practise completing them.
- Examples of car rental waiver, cover and insurance extracts, world travel rail and cruise fare training extracts and travel insurance policy benefit and premium training extracts to allow students to practise completing tickets and calculations.
- A practice examination to help students prepare for examinations.

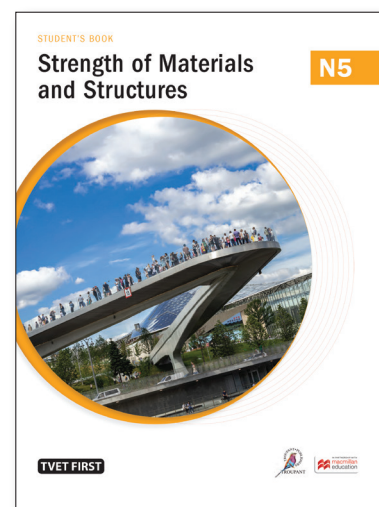
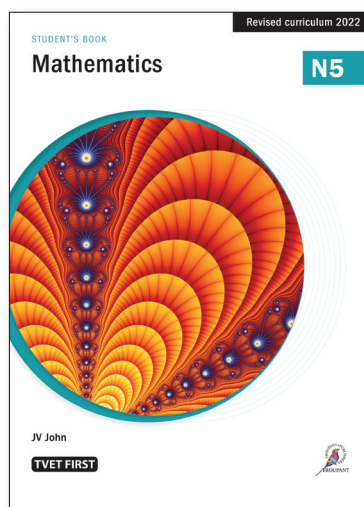
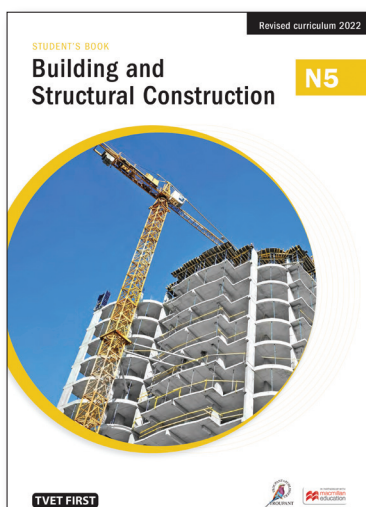
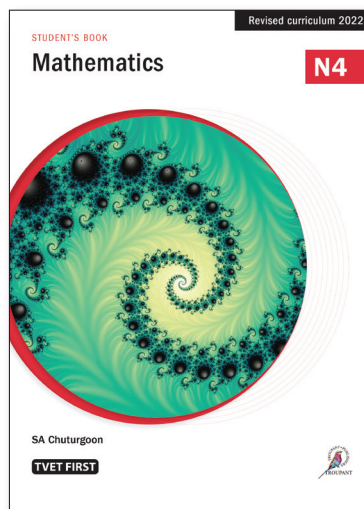
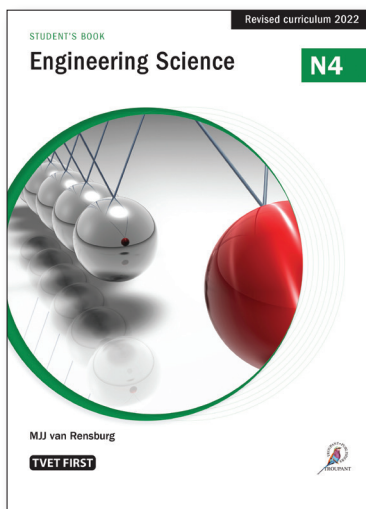
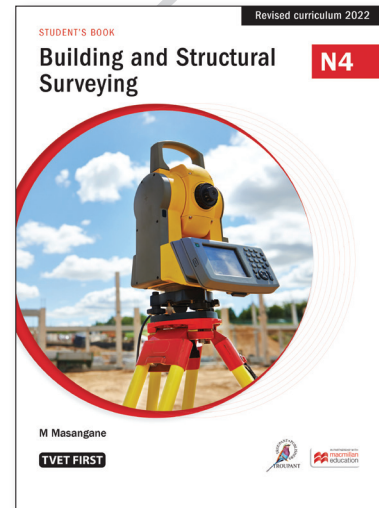
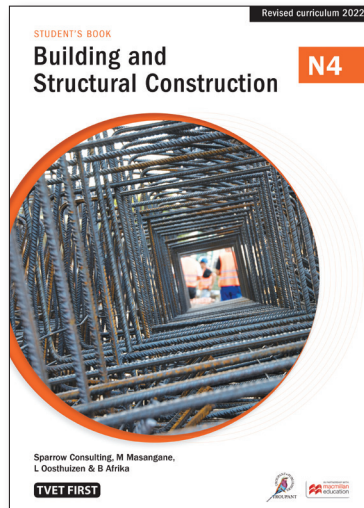
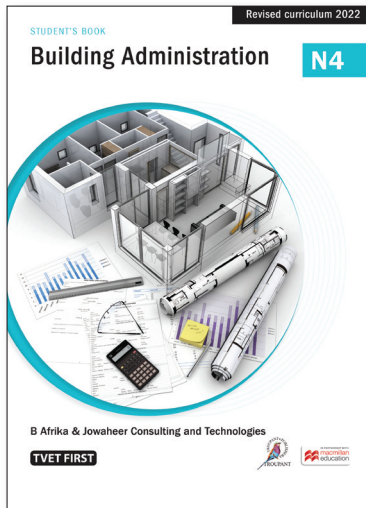
The Lecturer's Guide includes the following:

- Comprehensive answers to all activities and assessments.
- Full mark allocations for solutions to aid lecturers with marking and examination preparation.
- and learning strategies.
- Lesson and teaching plans incorporated via the 17-week plan and overview of learning outcomes.
- Two class tests with memoranda for lecturers to use as assessments.
- Links to relevant videos and online materials.
- Printable resources.

TVET First authors

M Brett & M Jacobs

Engineering



Building Administration N4

This document includes important information about the revised curriculum for Building Administration N4, scheduled for implementation in 2022. For best results, use *TVET First Building Administration N4*.

Overview of main curriculum changes

- The curriculum is divided into eight modules (the previous curriculum had eleven modules) with specific requirements for each module. The learning outcomes are more specific about the requirements for each section.
- Module 3 is now called 'Site preparation' and not 'Site organisation' as in the old curriculum.
- Module 7 (Foundations) is completely new content.
- The content in the old curriculum relating to strutting and trenches does not form part of the new curriculum for N4.
- The new curriculum expects students to be able to draw and incorporate construction activities and timelines in a Gantt chart as well as to measure progress using it.

Syllabus weighting

Module	Weighting
1. Professional consultants	10
2. Building firms	10
3. Site preparation	15
4. Planning and programming	10
5. Building materials	15
6. Construction equipment	20
7. Foundations	10
8. Organisations	10
Total	100

Detailed curriculum changes

Changes to the previous curriculum	New content in 2021 curriculum
Module 1: Professional consultants The content in Module 1 was previously covered in Module 3.	Module 1: Professional consultants 1.1 Duties and responsibilities 1.1.1 Explain the duties and the responsibilities of the following professionals in the construction industry: <ul style="list-style-type: none"> • Client/owner/employer (NEW) • Architect

Building Administration N4

Changes to the previous curriculum	New content in 2021 curriculum
	<ul style="list-style-type: none"> • Site foreman (NEW) • Quantity surveyor • Structural engineer • Mechanical engineer • Electrical engineer • Land/building surveyor • Building inspector • Clerk of works • Building inspector
<p>Module 2: Building firms</p> <p>Module 2 was partially covered under Module 1 of the old curriculum. The rest of the content was covered under Module 2 of the old curriculum.</p> <ul style="list-style-type: none"> • Unit 2.1 was covered under Sub-Unit 1.1.3 of the old curriculum. • Unit 2.3 is fully covered under Unit 2.1 of the old textbook. 	<p>Module 2: Building firms</p> <p>2.1 Types of building firms</p> <p>2.1.1 Explain the structure and operating functions of the following types of firms:</p> <ul style="list-style-type: none"> • Small • Medium • Large <p>2.2 Acquiring business</p> <p>2.2.1 Explain the following different methods used to obtain business opportunities:</p> <ul style="list-style-type: none"> • Recommendation • Business website • Advertising • Open and selective tendering • Arrangement • Competitive bidding • Reputation • Negotiation • Request • Rotation <p>2.3 Departments of a building firm</p> <p>2.3.1 Distinguish between the roles and responsibilities of the following departments in construction firms:</p> <ul style="list-style-type: none"> • Contracts department • Estimating department • Costing department • Buying department • Plant and maintenance department • Accounts department • Human resources department

Building Administration N4

Changes to the previous curriculum	New content in 2021 curriculum
<p>Module 3: Site preparation</p> <p>Module 3 is partially covered under Module 5 of the current book.</p> <ul style="list-style-type: none"> Unit 3.1 is partially covered, the top site preparation is missing – Entry and Exit, – Drainage, – Soil Testing and – Site Signage, the rest of the sub-headings are covered. Unit 3.2 is partially covered; only two sub-topics are not covered. Unit 3.3 is minimally covered. The only reference made is to covered walkways, which are covered extensively. 	<p>Module 3: Site preparation</p> <p>3.1 Organisational structure on a building site</p> <p>3.1.1 Describe the roles of the various construction team members on a building site: (NEW)</p> <ul style="list-style-type: none"> Contracts manager Projects manager General foreman Trades foreman Artisans Labourers Operators Subcontractors Storekeeper Gate watchman <p>3.2 Site preparation</p> <p>3.2.1 List and explain the following preliminaries to be done in preparing a site:</p> <ul style="list-style-type: none"> Access roads Demolition of existing structures Entry and exit controls Hoardings Security Site clearance Drainage Vegetation Electricity/water Soil testing Site signage board <p>3.3 Site layout</p> <p>3.3.1 Sketch and label a proper site layout considering the location of the following areas:</p> <ul style="list-style-type: none"> Storage area Site office Plant location Ablution facilities Health and safety

Building Administration N4

Changes to the previous curriculum	New content in 2021 curriculum
	<p>3.4 Regulations</p> <p>3.4.1 Explain the regulations to be adhered to with reference to the following:</p> <ul style="list-style-type: none"> • Covered walkways • Temporary roads • Traffic control • Use of cranes • Protection orders • Adjoining property • Approvals from local authorities
<p>Module 4: Planning and programming</p> <p>Module 4 was covered in Module 11 in the previous curriculum.</p>	<p>Module 4: Planning and programming</p> <p>4.1 Planning</p> <p>4.1.1 Explain the types of planning and the factors to be considered in each of the following:</p> <ul style="list-style-type: none"> • Steps to program planning (NEW) • Financial planning • Personnel planning • Organisational planning • Stage and period planning • Importance of planning <p>4.1.2 Draw and incorporate construction activities and time in a Gantt chart and how to measure progress using it. (NEW)</p>
<p>Module 5: Building materials</p> <ul style="list-style-type: none"> • Unit 5.1: The old curriculum only covered the ordering, receipt and storage of materials. • Unit 5.2: Order forms were not covered previously. • Unit 5.3: Only waste management was covered in the previous curriculum. 	<p>Module 5: Building materials</p> <p>5.1 Ordering</p> <p>5.1.1 Describe the procedure to be followed in:</p> <ul style="list-style-type: none"> • Ordering and receiving • Follow-up on orders (NEW) • Storage of various materials • Cost and quality (NEW) <p>5.2 Documentation</p> <p>5.2.1 Differentiate between and understand the use of the following documents:</p> <ul style="list-style-type: none"> • Order form (NEW) • Requisition form • Delivery note • Invoice • Receipt

Building Administration N4

Changes to the previous curriculum	New content in 2021 curriculum
	5.3 Wastage 5.3.1 Explain wastage management on site related to: <ul style="list-style-type: none"> • Control waste • Improper storage • Improper handling (NEW) • Damage of material on delivery • Theft (NEW)
Module 6: Construction equipment Module 6 was covered in Modules 4, 5, 9 and 10 of the previous curriculum. <ul style="list-style-type: none"> • Unit 6.1 was covered by Module 9 of the old curriculum, but the new curriculum specifies the different types of scaffolding in detail. • 6.1.2 Is new information. • Unit 6.2 is partially covered. Power tools are covered in Module 4 of the current book; hand tools are covered in Module 5 and hoisting is covered in Module 10. • Excavations equipment, levelling equipment, compacting equipment, concrete mixing machines and transporting equipment are all new topics. 	Module 6: Construction equipment 6.1 Scaffolding 6.1.1 Describe the following types of scaffolding and its parts and uses: <ul style="list-style-type: none"> • Independent scaffolding • Putlog scaffolding • Cantilever scaffolding • Hanging scaffolding • Mobile scaffolding 6.1.2 Explain the factors to inspect in establishing the safety of scaffolding: (NEW) <ul style="list-style-type: none"> • Erection • Sturdiness • Anchoring to structures • Platforms 6.2 Equipment and machineries 6.2.1 Identify the following items of construction equipment and their uses: <ul style="list-style-type: none"> • Hoisting equipment • Excavation equipment • Levelling equipment • Compacting equipment • Concrete mixing machineries • Transporting equipment • Hand and power tools

Building Administration N4

Changes to the previous curriculum	New content in 2021 curriculum
<p>Module 7: Foundations (NEW)</p> <p>The content in this module is completely new and was not covered at all in the old curriculum.</p>	<p>Module 7: Foundations (NEW)</p> <p>7.1 Functions of foundation</p> <p>7.1.1 Analyse the use of having a good foundation:</p> <ul style="list-style-type: none"> ● Importance of having a good foundation ● Transferring of loads ● Differential settlement ● Problems of a weak foundation <p>7.2 Types of foundation</p> <p>7.2.1 Draw and choose the kind of foundations suitable for various soil conditions:</p> <ul style="list-style-type: none"> ● Raft foundations ● Pile foundations ● Strip foundations ● Buoyed foundations ● Pad foundations ● Cantilevered foundations <p>7.3 Soil conditions</p> <p>7.3.1 Describe the use of soil testing:</p> <ul style="list-style-type: none"> ● Testing of soil ● Soil types and properties ● Load testing
<p>Module 8: Organisations in the construction industry</p> <p>Some of Module 8 was covered in Module 1 in the old curriculum.</p>	<p>Module 8: Organisations in the construction industry</p> <p>8.1 Organisations</p> <p>8.1.1 Differentiate between various types of organisations and their structure:</p> <ul style="list-style-type: none"> ● Organisation ● Components (NEW) ● Types of companies ● Organisation charts ● Authority and delegation (NEW) ● Kinds of organisation ● Disadvantages of various organisation kinds (NEW)

Building Administration N4

Features of *TVET First Building Administration N4*

The series has been fully updated and is aligned with the new 2021 curriculum. Recommended by the Department of Higher Education and Training, it was written and updated by a construction entrepreneur and an experienced TVET Civil Engineering lecturer.

The Student's Book has the following features:

- A variety of illustrations, photos and diagrams to explain the new content in Module 7 (Foundations) in detail, making it practical and easy to understand.
- Module 6 is the largest section of the book and has a weighting of 20%. It covers construction equipment in detail.
- Starter activities to help stimulate discussions for learning.
- Clear explanations of new terminology.
- Practical advice from a practising building professional.
- A simple, step-by-step approach to problem solving.
- Varied activities that consolidate students' knowledge.
- Photographs and clear diagrams to aid understanding.
- Summaries and examination-type summative assessments at the end of each module, which are indispensable tools for revision and examination preparation.
- Clear highlighting and explanation of important terminology to help students understand difficult concepts and overcome language barriers.

The Lecturer's Guide has the following features:

- Lesson and teaching plans incorporated via the weekly plan.
- Comprehensive answers to all activities.
- Two formal tests with marking memoranda.
- Full mark allocations to aid lecturers with marking and examination preparation.

TVET First authors

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Building and Structural Construction N4

This document includes important information about the revised curriculum for Building and Structural Construction N4, scheduled for implementation in 2021. For best results, use *TVET First Building and Structural Construction N4*.

Overview of main curriculum changes

- There have not been many fundamental changes to this curriculum for 2022.
- It has, however, been broken down into weighted modules with learning content and detailed, numbered learning outcomes. The order in which the modules are taught has changed slightly.
- References to materials no longer used in construction, such as asbestos, have been removed.
- Areas where drawing is the focus have been explicitly stated. However, this is largely a confirmation of what has been focused on in the examinations.
- There are, nevertheless, some ambiguities and contradictions that will have to be addressed in future revisions. These include the following:
 - The thickness of walls to be taught: The preamble to Module 3 states, "... the student should be able to identify and draw English and stretcher bonds one and half and two brick walls respectively", but LO 3.1 states, "Alternative plan courses and isometric view in right angle corner, T-junction and cross-junction one and one and half thick brick wall." Half brick walls appear to have been omitted.
 - In LO 6.1, the syllabus states, "... Lean-to roof (steel and timber parapet wall)". This appears to be an error; it should probably read "Steel and timber truss lean-to roofs built against a brick or concrete parapet wall."
- Learning outcomes not explicitly stated in the old syllabus but were regularly examined have now been clearly defined in the 2021 syllabus document.

Modules and weightings

The new syllabus has been broken down into modules with weightings as set out in the table that follows.

New curriculum (2021)

		Total percentage
Module 1	Foundations	10
Module 2	Damp proofing	10
Module 3	Bonds in brickwork	10
Module 4	Arches	10
Module 5	Steel door frames and windows	10
Module 6	Roofs	15
Module 7	Roof covering	5

Building and Structural Construction N4

		Total percentage
Module 8	Guttering	5
Module 9	Ceilings	5
Module 10	Structural steelwork	20
Total		100%

Summary of changes

Overview/highlights

- The syllabus is largely unchanged.
- Modules have now been given weightings.
- Learning outcomes have been numbered and listed in more detail.
- Many learning outcomes that were not explicitly listed in the old syllabus but were regularly tested in examinations have now been included in the syllabus document.

Detailed curriculum changes

	Old syllabus	New syllabus
		<i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i>
Module 1: Foundations General aim: On completion of this module, the student should be able to explain, identify and select a suitable foundation for different building circumstances. Weighting: 10%.	<u>Learning content remaining:</u> <ul style="list-style-type: none"> • For solid walls to two-brick thickness • For cavity walls to doublestorey height, according to ratios and standard building regulations • Typical concrete mixtures <u>Content removed:</u> <ul style="list-style-type: none"> • (Thickness of walls unspecified in new syllabus) 	<u>Specific learning outcomes in new syllabus:</u> 1.1 Soil Analyse the following different soil samples from a given scenario in order to choose a suitable foundation: <ul style="list-style-type: none"> • Clay soil • Loam soil • Loose or sandy soil 1.2 Types of foundations Identify and draw the following different types of foundations: <ul style="list-style-type: none"> • Strip foundation • Stepped foundation • Raft foundation • Pad foundation • Pile foundation

Building and Structural Construction N4

	Old syllabus	New syllabus <i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i>
		1.3. Strength and mix proportions Explain strengths, mixing proportions and curing requirements according to Standard Building Regulations for single and double storey buildings.
Module 2: Damp proofing General aim: On completion of this module, the student should be able to identify materials used for damp proofing of foundations, basements, walls and roof structures, and describe their application. Weighting: 10%.	Formerly Module 3 <u>Learning content remaining:</u> <ul style="list-style-type: none"> Materials and applications, also for basement walls <u>Content removed:</u> <ul style="list-style-type: none"> (none) 	<u>Specific learning outcomes in new syllabus:</u> <p>2.1 Materials Describe the following dampproofing materials and their application methods (NOW EXPLICITLY STATED):</p> <ul style="list-style-type: none"> Plastic DPC and DPM Bitumen sheeting Torch-on systems <p>2.2 Position of damp proof course (DPC) Draw neatly labelled vertical/horizontal section indicating the position of the DPC below window opening and cavity wall. (NEW)</p> <p>2.3 Thermal insulation Draw to scale a neatly labelled vertical section through the eaves of a 30° pitch roof truss showing thermal insulation and ventilation. (NEW)</p>

Building and Structural Construction N4

	Old syllabus	New syllabus <i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i>
		2.4 DPC on basement walls Produce a neatly labelled drawing showing a method of damp proofing on the following structures: <ul style="list-style-type: none"> Basement walls Concrete tanks (septic tanks, swimming pools) (NEW)
Module 3: Bonds in brickwork General aim: On completion of this module, the student should be able to identify and draw English and stretcher bonds one and half and two brick walls respectively. Weighting: 10%.	<u>Learning content remaining:</u> <ul style="list-style-type: none"> English, stretcher to two-brick thickness (solid) and for cavity walls to double-storey Corner junctions and Tjunctions with stopped ends <u>Content removed:</u> <ul style="list-style-type: none"> Garden wall bonds Concrete building blocks Wall bonding for face-brick exteriors 	<u>Specific learning outcomes in new syllabus:</u> 3.1 Types of brick bonding Draw and identify the following bonds in brickwork: <ul style="list-style-type: none"> English bond Stretcher bond Flemish bond (NEW) Alternative plan courses and isometric view in right angle corner, Tjunction and crossjunction one and one-and-a-half brick thick wall 3.2 Draw to scale the following in acute and obtuse angled brickwork: <ul style="list-style-type: none"> English bond Stretcher bond Flemish bond

Building and Structural Construction N4

	Old syllabus	New syllabus
<p>Module 4: Arches</p> <p>General aim: On completion of this module, the student should be able to explain and draw different types of arches (only brickwork).</p> <p>Weighting: 10%.</p>	<p><u>Learning content remaining:</u></p> <ul style="list-style-type: none"> • Half-circular arches and concrete arches up to three ringed • Rough and axed types • Steel and timber centring for arches <p><u>Content removed:</u> (none)</p>	<p><i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i></p> <p><u>Specific learning outcomes in new syllabus:</u></p> <p>4.1 Openings Draw to scale the position of centring in arches for both steel and timber.</p> <p>4.2 Draw the following different types of arches:</p> <ul style="list-style-type: none"> • Segmental arches • Half circular arches (two- and three-ringed) • Rough and axed types • Flat gate arch (brick on edge or soldier brick) <p>(NEW)</p>
<p>Module 5: Steel door frames and windows</p> <p>General aim: On completion of this module, the student should be able to draw vertical and horizontal cross section of a steel window and door frames.</p> <p>Weighting: 10%.</p>	<p><u>Learning content remaining:</u></p> <ul style="list-style-type: none"> • Steel door frames to opening of one-and-a-half brick walls and cavity walls, setting up and installation • Steel windows, residential and industrial types, setting up and installation • Types of glazing available and short descriptions of the characteristics of each type <p><u>Content removed:</u> (none)</p>	<p><u>Specific learning outcomes in new syllabus:</u></p> <p>5.1 Doors and windows Describe by means of a neatly labelled drawing the process of setting up a steel door and window frame in horizontal and vertical cross section for both one brick and cavity wall.</p> <p>5.2 Draw the vertical and horizontal cross section to show the top and bottom part of domestic and industrial type of steel casement window frames.</p> <p>5.3 List different types of glass and describe their characteristics.</p>

Building and Structural Construction N4

	Old syllabus	New syllabus
<p>Module 6: Roofs (up to 9 m span)</p> <p>General aim: On completion of this module, the student should be able to demonstrate their understanding of the difference between steel and timber roof trusses.</p> <p>Weighting: 15%.</p>	<p><u>Learning content remaining:</u></p> <ul style="list-style-type: none"> Steel roof trusses of riveted and welded construction (Fink, monitor and saw-tooth trusses) Timber trusses of bolted and gang nail construction Lean-tos (steel and timber) <p><u>Content removed:</u></p> <ul style="list-style-type: none"> (none) 	<p><i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i></p> <p><u>Specific learning outcomes in new syllabus:</u></p> <p>6.1 Types of roofing List and draw the following types of roofing:</p> <ul style="list-style-type: none"> Howe (NEW) Mono pitched (NEW) Pratt pitched (NEW) Pratt bridge (NEW) Camelback truss (NEW) Three-bay saw-tooth trusses Three-bay fan trusses (NEW) Lean-to roof (steel and timber) <p>6.2 Draw to scale the following connection of timber and steel roof trusses construction:</p> <ul style="list-style-type: none"> Bolted Nailed (NEW) Gang nailed <p>6.3 Describe the following roof trusses of riveted and bolted construction:</p> <ul style="list-style-type: none"> Fink Monitor Saw tooth <p>6.4. Draw the vertical section through the pitch and valley of steel roof trusses. (NEW)</p>

Building and Structural Construction N4

	Old syllabus	New syllabus
		<i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i>
Module 7: Roof covering General aim: On completion of this module, the student should be able to describe the different types of roof covering and methods used in fixing them on timber and steel roof trusses. Weighting: 5%.	<u>Learning content remaining:</u> <ul style="list-style-type: none"> Galvanised corrugated sheet iron Galvanised ribbed sheeting (long span) Installation on timber and steel trusses <u>Content removed:</u> <ul style="list-style-type: none"> Corrugated asbestos-cement sheeting 	<u>Specific learning outcomes in new syllabus:</u> 7.1 Types of roof covering Describe by means of a neatly labelled drawing the different types of roof covering and methods in fixing them on timber and steel roof trusses: <ul style="list-style-type: none"> Concrete/clay tiles (NEW) Corrugated IBR roof sheeting Long span aluminium roofing sheet (NEW) Step tiles (NEW) 7.2 Sealants Discuss the application for water proofing and torch-on systems. (NEW)
Module 8: Guttering General aim: On completion of this module, the student should be able to describe the different types of gutters with down pipes and galvanised sheeting, fibrecement and plastic material. Weighting: 5%.	<u>Learning content remaining:</u> <ul style="list-style-type: none"> Half-round gutters, square gutters and box gutters with down pipes of galvanised sheeting, and plastic material <u>Content removed:</u> <ul style="list-style-type: none"> Asbestos-cement guttering 	<u>Specific learning outcomes in new syllabus:</u> 8.1 Types of guttering Draw the following types of gutters with down pipes and galvanised sheeting, fibrecement and plastic material: <ul style="list-style-type: none"> Half round Square Box gutter

Building and Structural Construction N4

	Old syllabus	New syllabus
		<i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i>
Module 9: Ceilings General aim: On completion of this module, the student should be able to draw different types of ceilings. Weighting: 5%.	<u>Learning content remaining:</u> <ul style="list-style-type: none"> Gypsum plasterboard, fibreboard, acoustic ceiling materials, pressed metal suspended ceilings, suspended ceiling systems, tongue and groove ceilings <u>Content removed:</u> <ul style="list-style-type: none"> Asbestos-cement ceiling board 	<u>Specific learning outcomes in new syllabus:</u> 9.1 Types of ceilings List and draw the following different types of ceilings: <ul style="list-style-type: none"> Gypsum/rhino plaster board Fibre board Fibre cement Tongue and groove Acoustic ceiling materials Pressed steel Suspended ceilings 9.2 Draw to scale ceiling construction detail for suspended ceilings (aluminium framing)
Module 10: Structural steelwork General aim: On completion of this module, the student should be able to draw various elements of steelwork structures. Weight 20%	<u>Learning content remaining:</u> <ul style="list-style-type: none"> Bolted, riveted and welded structural steelwork Welding symbols, types of bolts, types of rivets Column bases and column heads for universal columns Beam connections with beams and columns <u>Content removed:</u> <ul style="list-style-type: none"> Column heads with latticework 	<u>Specific learning outcomes in new syllabus:</u> 10.1 Designing structures for steelwork Draw the different types of: <ul style="list-style-type: none"> Rivets Welding symbols Hexagonal bolt and nut (NEW) 10.2 Differentiate by means of a neatly labelled drawing between a steel beam and a steel column. (NEW) 10.3 Draw a neatly labelled angle iron, gusset plate and holding down bolts.

Building and Structural Construction N4

	Old syllabus	New syllabus
		<p><i>Learning outcomes updated to match examination traditions with the following specific outcomes:</i></p> <p>10.4 Draw a neatly labelled steel column to beam connection beam to beam connection at right angles.</p> <p>10.5 Draw a neatly labelled vertical side and top view of a column beam connection.</p> <p>10.6 Draw to scale a neatly labelled steel column and base plate connected to a concrete foundation.</p> <p>10.7 Draw a neatly labelled isometric view of a section showing the base plate, gusset plates, angle iron, steel stanchions and beam.</p>

TVET First authors

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Building and Structural Surveying N4

This document includes important information about the revised curriculum for Building and Structural Surveying N4, scheduled for implementation in 2022. For best results, use *TVET First Building and Structural Surveying N4*.

Overview of main curriculum changes

- The previous syllabus (1980) had five sections:
 - General
 - Basic concepts
 - Distance measurement (taping)
 - Minor instruments and components
 - Practical.
- The new curriculum has nine modules with expanded content and more detail on how the outcomes should be demonstrated.
- Many learning outcomes that were not explicitly stated in the old syllabus but were regularly examined have now been defined in the 2022 curriculum document.
- Some work has moved from N5 to N4, notably:
 - Angular measurement (all of the content in Module 5 is new)
 - Setting out (all of the content in Module 6 is new)
 - From N5 Basic principles: Methods of fixing a point, trilateration, intersecting arcs, rectangular offsets, triangulation, polar coordinates and control, characteristics of different types of errors
 - From N5 Linear measurement: Calculation of slope correction for distances measured on an incline; Measuring around a pond, across a river or busy road; Measuring when a building obstructs vision
 - From N5: Height measurement: Sources of vertical control; Datum as reference for benchmarks; Use of maps to obtain the position of control points; Establishment of benchmarks giving reasons for use; Recording and calculating-reduced levels by 'rise-and-fall' and 'collimation' methods including inverted staff and application of the required checks and corrections.

Modules and weightings

Weightings for sections of work were not specified in the previous curriculum. The table that follows sets out the weighting per module for the 2022 curriculum.

Module	Weighting
1. Basic principle of surveying	15
2. Linear measurement	15
3. Height measurement	10
4. Basic concepts	10
5. Angular measurement	10
6. Setting out	10

Building and Structural Surveying N4

Module	Weighting
7. Areas and volumes	10
8. Plane table surveying	10
9. Compass surveying	10
Total	100

Detailed syllabus changes

Comments on old syllabus content	New syllabus
<p>From previous curriculum: General: Definition of plane surveying; various qualities and functions of a types of surveying; surveyor.</p> <p>Methods of fixing a point were previously covered in N5 Basic principles.</p> <p>The new curriculum shows how surveying can be categorised in different ways; the main types are plane and geodetic surveying. Furthermore, surveying can be classified according to the nature of the field, the purpose of the survey, the method implemented and the instrument used.</p>	<p>Module 1: Basic principles of surveying</p> <p>1.1 Surveying</p> <p>1.1.1 Define the term 'surveying'.</p> <p>1.1.2 Define the objectives, purpose and principles of surveying.</p> <p>1.2 Methods of fixing a point in surveying</p> <p>1.2.1 Sketch and list the following principles/ methods of fixing a point in surveying:</p> <ul style="list-style-type: none"> • Ties (trilateration) • Sideways intersection • Forward intersection (triangulation) • Resection • Perpendicular offsets (rectangular offset) • Length and direction (polar coordinates) <p>1.3 Types of surveying</p> <p>1.3.1 List and explain the following main categories of surveying:</p> <ul style="list-style-type: none"> • Plane surveying • Geodetic surveying <p>1.4 Classification of surveying</p> <p>1.4.1 List and explain the following types of surveys which are based on the nature of the field:</p> <ul style="list-style-type: none"> • Topographic surveying • Cadastral survey • Hydrographic survey • Engineering survey • Astronomical survey

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
<p>The use of the field book is usually examined, but the content here is new, especially the detail on points to observe when taking field notes and the information that the field book must contain.</p>	<p>1.4.2 List and explain the following types of surveys which are based on the purpose of the survey:</p> <ul style="list-style-type: none"> • Mine surveying • Military surveying • Geological survey <p>1.4.3 List and explain the following types of surveys which are based on the method implemented:</p> <ul style="list-style-type: none"> • Triangulation • Traversing <p>1.4.4 List and explain the following types of surveys which are based on instrument used:</p> <ul style="list-style-type: none"> • Chain survey • Compass survey • Theodolite survey • Plane table survey • Photographic and aerial survey <p>1.5 Types of control points</p> <p>1.5.1 Define the term 'control point'.</p> <p>1.5.2 Explain the following types of control points:</p> <ul style="list-style-type: none"> • Trigonometric beacons (trig beacons) • Minor control points • Benchmarks • GPS control • Reference marks <p>1.6 Surveyor</p> <p>1.6.1 Describe the following functions of a good surveyor:</p> <ul style="list-style-type: none"> • Field work • Office work/administrative functions • Care and adjustments of instruments <p>1.6.2 Describe the qualities of a good surveyor.</p> <p>1.6.3 Explain the purpose of a field book.</p> <p>1.6.4 Describe and list the following survey field notes:</p> <ul style="list-style-type: none"> • Points to observe when taking field notes

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
	<ul style="list-style-type: none"> • Classification of field notes <p>1.6.5 List the information to be contained in the field book.</p>
<p>From old curriculum: Distance measurement (taping): Description, maintenance and handling of steel tapes; mention of chains and other types of tapes; corrections, temperature, pull, sag, slope, height above sea level; step chaining; sources of error and mistakes in taping, checks booking and reduction of results; chain surveying; taping in catenary (proof of formulae not required). Introduction to electronic distance measurement.</p> <p>In Unit 2.3 (Field problems), the work on measuring around an obstacle and across a river or road is from the previous N5 curriculum.</p> <p>The calculation of error corrections is regularly examined, but is specified in detail in the new curriculum.</p>	<p>Module 2: Linear measurement</p> <p>2.1 Linear surveying methods</p> <p>2.1.1 Explain the following linear surveying methods:</p> <ul style="list-style-type: none"> • Direct measurement • Measurement by optical means • Electronic method <p>2.1.2 Explain the functions and advantages of electronic distance measurement.</p> <p>2.2 Chain surveying/tape</p> <p>2.2.1 List the advantages and disadvantages of the following linear measurement equipment:</p> <ul style="list-style-type: none"> • Chain • Steel tape <p>2.3 Field problems</p> <p>2.3.1 Explain the following with the aid of a neatly labelled sketch:</p> <ul style="list-style-type: none"> • Measuring around building/pond • Measuring distance across a river/busy road • Measuring when there is an obstacle to line of sight <p>2.4 Errors and mistakes in survey measurements</p> <p>2.4.1 Explain types of errors and mistakes in surveying measurements:</p> <ul style="list-style-type: none"> • Accidental errors • Constant errors • Systematic errors • Mistakes <p>2.5 Errors in measurement and corrections</p> <ul style="list-style-type: none"> • Calculate the following error corrections that may occur during taping because of: <ul style="list-style-type: none"> – Sag – Tension

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
	<ul style="list-style-type: none"> – Slope – Temperature – Length – Altitude at sea level
<p>From old curriculum: Minor instruments and components: Construction, handling, care and adjustment of Abney level and optical square, tacheometer staves and levelling staves; compass; bubble tube sensitivity, axis of bubble; the use of bubbles in surveying instruments; telescopes – construction, including provision of cross-hairs (no defects); lines of sight and collimation; parallax and its elimination.</p> <p>Much of this module is from the previous N5 curriculum.</p>	<p>Module 3: Height measurement</p> <p>3.1 Definition of levelling</p> <p>3.1.1 Explain the term 'levelling' and the purpose of levelling</p> <p>3.2 Levelling terminology</p> <p>3.2.1 Explain the following terminology as used in levelling:</p> <ul style="list-style-type: none"> • Mean sea level (MSL) • Local heights • Datum • Closure error • Official heights • A horizontal plane (horizontal line) • A plane • Direction of gravity • Vertical plane • Incline plane • Level surface (level line) • Benchmark (BM) • Foresight (FS) • Intermediate sight (IS) • Back-sight • Collimation line (line of sight) • Change point <p>3.3 Open and close traverse levelling</p> <p>3.3.1 Explain the difference between close and open traverse levelling.</p>

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
	<p>3.4 Errors in levelling</p> <p>3.4.1 Explain the following types of errors in levelling:</p> <ul style="list-style-type: none"> • Natural causes • Instrument errors • Personal errors <p>3.5 Levelling equipment</p> <p>3.5.1 Explain the following types of levelling equipment:</p> <ul style="list-style-type: none"> • Traveller/boning rod • Change plate • Dumpy level • Tilting level • Automatic level • Staff bubble • Levelling staff • Tripod stand • Bubble tube <p>3.6 Hand signals</p> <p>3.6.1 Understand the hand signals used by the good surveyor to communicate.</p> <p>3.7 Reducing levels</p> <p>3.7.1 Calculate the reduced levels by means of the following:</p> <ul style="list-style-type: none"> • Rise-and-fall method • Collimation method <p>3.8 Collimation error</p> <p>3.8.1 Determine the collimation error by two peg test.</p> <p>3.9 Reciprocal levelling</p> <p>3.9.1 Define reciprocal levelling.</p> <p>3.9.2 Reduce reciprocal levels by means of calculations.</p>

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
<p>From old curriculum: Basic concepts: Natural and engineers scales; relation between accuracy of survey, the scale of the map of plan and its purpose; mistakes and errors; control checks; South African national control systems on position and height; radians, sexagesimal and centesimal angles; angles of direction, orientation; measures of area and volume; plane table.</p> <p>The South African coordinate system has been examined for some time, but detail has been added on plotting points and calculating distance and direction between two points.</p>	<p>Module 4: Basic concepts</p> <p>4.1 South African coordinate systems</p> <p>4.1.1 Describe the main South African coordinate system.</p> <p>4.1.2 Plot the position of points using the South African system by means of a scale.</p> <p>4.1.3 Calculate the distance and direction of coordinates between two or more known points.</p> <p>4.2 Map scale</p> <p>4.2.1 Explain the following types of scale:</p> <ul style="list-style-type: none"> • Engineering scale natural scale • Divided scale • Scale of map symbol • Transformation <p>4.2.2 Apply the correct formula to calculate transformation scale.</p> <p>4.3 Angular measurements</p> <p>4.3.1 Calculate and convert the following angular measurements:</p> <ul style="list-style-type: none"> • Sexagesimal measurement • Centesimal measurement • Radian measurement

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
<p>From old curriculum: Minor instruments and components: Construction, handling, care and adjustment of Abney level and optical square, tacheometer staves and levelling staves; compass; bubble tube sensitivity, axis of bubble; the use of bubbles in surveying instruments; telescopes – construction, including provision of cross-hairs (no defects); lines of sight and collimation; parallax and its elimination.</p> <p>Practical work: Chaining; use of Abney level, optical square and plane table.</p> <p>Much of Module 5 is new, especially the structure and use of the theodolite. This was previously examined in N5.</p>	<p>Module 5: Angular measurement</p> <p>5.1 Purpose of angular measurement</p> <p>5.1.1 Explain how the horizontal and vertical angular measurement are related on points on the ground.</p> <p>5.2 Theodolite</p> <p>5.2.1 Explain the types and the uses of theodolite, term used when measuring with a theodolite such as:</p> <ul style="list-style-type: none"> • Vertical axis • Horizontal axis • Circle left • Circle right • Changing face • Swinging the telescope • Transiting the telescope • Axis of telescope • Axis of bubble tube • Bisecting a point or station <p>5.3 Using a theodolite</p> <p>5.3.1 Explain the correct procedures when setting up a theodolite and when taking the readings.</p> <p>5.4 Horizontal angles</p> <p>5.4.1 Explain the procedure in the following methods of horizontal angles measurement:</p> <ul style="list-style-type: none"> • Repetition method • Reiteration method <p>5.4.2 Calculate the horizontal angle by means of circle left and circle right observations.</p> <p>5.5 Horizontal collimation and index error</p> <p>5.5.1 Determine the following:</p> <ul style="list-style-type: none"> • Collimation error of the horizontal axis • Index error

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
<p>Practical work: Use of Abney level, optical square.</p> <p style="color: red;">Setting out was previously covered in the N5 curriculum.</p>	<p>Module 6: Setting out</p> <p>6.1 Definition and purpose of setting out</p> <p>6.1.1 Define setting out.</p> <p>6.1.2 Explain the purpose of setting out.</p> <p>6.1.3 Explain the following terms that are used in setting out:</p> <ul style="list-style-type: none"> ● Traveller ● Sight rail ● Ranging rod ● Gradient ● Invert level <p>6.2 Setting out procedures</p> <p>6.2.1 Explain the procedure of setting out the following:</p> <ul style="list-style-type: none"> ● Setting out two points A and B, stationed on the third point of known coordinates ● Setting out a building from a baseline ● Setting out a sloping out rectangular site for excavation and levelling ● Setting out a rectangular site along a road using the road as reference <p>6.3 Equipment for setting out</p> <p>6.3.1 Draw and label the following equipment for setting out simple angles and their function:</p> <ul style="list-style-type: none"> ● Cross staff ● Abney level ● Optical square
<p>From old curriculum: Basic concepts: Measures of area and volume.</p> <p style="color: red;">New content in the curriculum: The specifications of the shapes, use of the planimeter, and volumes of earthworks and opencast mining.</p>	<p>Module 7: Areas and volumes</p> <p>7.1 Areas</p> <p>7.1.1 Calculate the area of the following different shapes:</p> <ul style="list-style-type: none"> ● Rectangles ● Triangles ● Trapezium ● Segments ● Circle

Building and Structural Surveying N4

Comments on old syllabus content	New syllabus
	<ul style="list-style-type: none"> • Parallelogram • Area of polygon with more than four sides • Irregular shapes • Planimeter <p>7.2 Volumes</p> <p>7.2.1 Calculate the volume of the following shapes:</p> <ul style="list-style-type: none"> • Earthworks • Opencast mining
<p>From old curriculum: Practical work: Plane table.</p>	<p>Module 8: Plane table surveying</p> <p>8.1 Plane table surveying</p> <p>8.1.1 Explain the term 'plane table' and the purpose of using a plane table.</p> <p>8.1.2 Explain the advantages and disadvantages of a plane table.</p> <p>8.1.3 Draw and label the components of plane table.</p> <p>8.1.4 Describe the hints for the setting up and smooth running of a plane table.</p> <p>8.1.5 List, draw and label the methods of fixing a point on a plane table.</p>
<p>From old curriculum: Minor instruments and components: Construction, handling, care and adjustment of compass; bubble tube sensitivity, axis of bubble; the use of bubbles in surveying instruments; telescopes.</p>	<p>Module 9: Compass surveying</p> <p>9.1 Compass surveying</p> <p>9.1.1 Define the term 'compass surveying' and its principles.</p> <p>9.1.2 Explain the advantages and disadvantages of compass surveying.</p> <p>9.1.3 Describe the requirements for the magnetic needle of a compass.</p> <p>9.1.4 Identify the following types of the magnetic compasses:</p> <ul style="list-style-type: none"> • Prismatic compass • Surveyor's compass <p>9.1.5 Calculate the following types of systems of bearing:</p> <ul style="list-style-type: none"> • Whole circle bearing • Quadrantal bearing

Important points

TVET First Building and Structural Surveying N4 includes many special features:

- In addition to activities for practising theoretical concepts, the authors have designed practical activities to help students develop a good understanding of new concepts in principles of fixing points in surveying, measurement techniques, working with surveying instruments and so on.
- Links to helpful internet videos support students' understanding of the work by demonstrating practical measurement techniques and the correct use of instruments.
- Students need to be able to define terms correctly in the examinations, so *TVET First* supports them by giving clear definitions of new terms.
- For easy revision, *TVET First* provides tables comparing methods and instruments, including the advantages and disadvantages of each one.
- Students must be able to draw and label diagrams in examinations, so the diagrams of instruments are designed to show the important parts clearly.
- Students need to be able to describe procedures in steps, so *TVET First* outlines all methods in easy-to-follow, illustrated steps.
- Calculations are explained step by step in a manner that helps students avoid common pitfalls.
- The practice examination at the end of the Student's Book, with a memorandum supplied in the Lecturer's Guide, gives students the opportunity to complete a mock examination based on the new content in the syllabus.
- The Lecturer's Guide includes a useful overview of the learning outcomes and learning content that can be used to compile your own six-month teaching plan.
- The Lecturer's Guide also includes two class tests with marking guidelines.

TVET First authors

M Masangane and L Maraschin

Engineering Science N4

Overview of main curriculum changes

- Change in the assessment standards (Bloom's taxonomy):
 - 'Knowledge' was 'Reproduction' and was weighted at 15%.
 - 'Understanding' was 'Analysis' and was weighted at 25%.
 - 'Application' was weighted at 35%.
 - 'Evaluation' was weighted at 25%.
- New assessment standards:

Knowledge	Understanding	Application	Evaluation
60	20	15	5

- Weightings have changed*.

Module	Weighting
1. Kinematics	15
2. Angular motion	12* (was 9%)
3. Dynamics	14* (was 12%)
4. Statics	15
5. Hydraulics	15* (was 20%)
6. Stress, strain and Young's modulus	25
7. Heat	15
Total	100

Major changes to the 2021 curriculum

Module 1: Kinematics (15%)	
Unit 1.1: Relative velocity	
<ul style="list-style-type: none"> 'Overtaking' calculations have been removed. 	New learning content/learning outcomes <ul style="list-style-type: none"> Solve problems dealing with constant linear motion analytically (Pythagoras or sine and cosine rules).
Unit 1.2: Resulting velocity	
<ul style="list-style-type: none"> Specific outcomes have been added. The use of Pythagoras, sine and cosine rules have been specified for linear motion calculations. 	New learning content/learning outcomes <ul style="list-style-type: none"> Calculate resulting velocity and direction of a maximum of two vectors. Calculate time to reach a certain destination.

Engineering Science N4

Module 1: Kinematics (15%)	
Unit 1.3: Projectiles	
<ul style="list-style-type: none"> A maximum of two vectors has been specified for resulting velocity. Calculations on launching vertically have been removed from projectiles. Specified outcomes have been added. 	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> Do calculations dealing with projectiles that are launched horizontally from a certain vertical height or launched at an angle from the horizontal landing on the same horizontal plane. Calculate maximum height reached by an object as well as time of flight and range. Calculate height and velocity at any part of the projectile path. Calculate velocity of projection. Calculate the angle of projection.
Module 2: Angular motion (12%)	
<ul style="list-style-type: none"> Was weighted at 9% 	
Unit 2.5: Torque, work done and power	
<ul style="list-style-type: none"> Content on angular displacement, velocity and acceleration has been separated into three learning content sections (units). Content on calculations for angular velocity has been added. 'Resistance to motion and friction' has been removed from torque calculations. 'Calculate the efficiency of transmission if the input power is given' has been removed. 	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> Calculate accelerating and decelerating torque if the mass moment of inertia of an object is given.
Module 3: Dynamics (14%)	
Was weighted at 9%	
Unit 3.1: Newton's three laws of motion	
<ul style="list-style-type: none"> New content on Newton's three laws of motion has been added. Clearer specifications for calculations on Newton's laws of motion have been supplied. 	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> Apply Newton's second law of motion. Sketch free body diagrams of vehicles travelling on horizontal or inclined planes while moving at constant speed, accelerating or decelerating.

Engineering Science N4

Module 3: Dynamics (14%)	
	<ul style="list-style-type: none"> Calculate the tractive effort and braking effort required for motion on horizontal and inclined planes with regard to practical problems, including gravitational force, rolling resistance force and inertia force.
Unit 3.2: Kinetic and potential energy	
<ul style="list-style-type: none"> New content has been specified. 	<ul style="list-style-type: none"> New learning content/learning outcomes Calculate kinetic and potential energies and energy loss.
Unit 3.3: Conservation of energy	
<ul style="list-style-type: none"> The specifications for conservation of energy calculations have been changed. 	New learning content/learning outcomes <ul style="list-style-type: none"> Apply the conservation of energy equation for a vehicle travelling due to its own weight only on horizontal and inclined planes (no tractive effort or braking effort applied)
Module 4: Statics (15%)	
Unit 4.1: Simply supported beams and cantilevers with point loads and uniformly distributed loads	
<ul style="list-style-type: none"> Now both simply supported beams and cantilevers are specified: <ul style="list-style-type: none"> Content has been added to these calculations. Centroids of laminae and centres of gravity split into separate units: <ul style="list-style-type: none"> Compound shapes have been included in these calculations. 	New learning content/learning outcomes <ul style="list-style-type: none"> Calculate the point of inflection. (Moved from N5.)
Module 5: Hydraulics (15%)	
<ul style="list-style-type: none"> Was 20% 	
Unit 5.2: Hydraulic pumps	
<ul style="list-style-type: none"> Content has been added. 	New learning content/learning outcomes <ul style="list-style-type: none"> Calculate the theoretical and actual flow rate of a reciprocating pump. Calculate the rotational frequency of a pump to deliver a given flow rate of water. Calculate the time taken to fill or empty a reservoir for a given flow rate.

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Module 5: Hydraulics (15%)	
Unit 5.3: Hydraulic accumulators	
<ul style="list-style-type: none"> Content has been added. 	New learning content/learning outcomes <ul style="list-style-type: none"> Name the types of accumulators found in industry. State the functions of an accumulator in a hydraulic system.
Module 6: Stress, strain and Young's modulus (14%)	
<ul style="list-style-type: none"> Now separated into only two units: <ul style="list-style-type: none"> Unit 6.1: Stress types Unit 6.2: Young's modulus Content has been added to both units. Content on compound bars is now included. 	
Unit 6.1: Stress types	
	New learning content/learning outcomes <ul style="list-style-type: none"> Name the three main types of stresses (direct, shear and bending). Calculations on stress, strain and Young's modulus for the material.
Unit 6.2: Young's modulus	
	New learning content/learning outcomes <ul style="list-style-type: none"> Calculate change in length or total change in length for compound rods.
Module 7: Heat (15%)	
<ul style="list-style-type: none"> Clearer specification of content and outcomes. Learning content now split into four separate units. New content on gas processes has been added. 	
Unit 7.1: Volumetric change in solids	
	New learning content/learning outcomes <ul style="list-style-type: none"> Calculate the volumetric coefficient of expansion given the linear coefficient of expansion.

Engineering Science N4

Module 7: Heat (15%)	
	<ul style="list-style-type: none"> • Calculate the change in volume and final volume due to temperature change. • Calculate the percentage change in volume.
Unit 7.2: Volumetric change in liquids	
	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> • Explain the anomaly in the expansion of water. • Calculate the change in volume and final volume. • Calculate the change in the level of the liquid in a container due to temperature change. • Calculate overflow in a container filled with liquid due to temperature change.
Unit 7.3: Volumetric change in gases	
	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> • State the characteristic gas law with relevant formula. • State Boyle's law with relevant formula and PV-graph. • State Charles's law with relevant formula and VT-graph. • State Gay-Lussac's law with relevant formula and PT graph. • Do calculations on pressure, volume, temperature, mass and gas constant on all four different processes.
Unit 7.4: Gas processes	
	<p>New learning content/learning outcomes</p> <ul style="list-style-type: none"> • Define the three basic gas processes (isochoric, isobaric and isothermal). • Sketch the PV diagrams for isochoric, isobaric and isothermal processes. • Do calculations on work done, change in internal energy and heat flow for all three processes. • Sketch PV diagrams of a maximum of two successive gas processes.

Engineering Science N4

Module 7: Heat (15%)

- Do calculations on work done, change in internal energy and heat flow for the two successive processes.

Features of *TVET First Engineering Science N4*

The series has been fully updated and is aligned with the new 2022 curriculum. The writer is a well-respected textbook author with over 35 years of lecturing experience.

The Student's Book has the following features:

- Concise explanations to guide students through the curriculum.
- Varied activities modelled on examination-type questions that consolidate knowledge and allow plenty of examination practice.
- Step-by-step worked examples to aid explanations of new additions to the syllabus.
- Figures and graphs to support understanding.
- Alternative methods to cater for different learning styles.
- Summaries and examination-type summative assessments at the end of each module, which are indispensable tools for revision and examination preparation.
- A practice examination set in the same style as an examination of the Department of Higher Education.
- 'See it online' links to online material to aid understanding of explanations.

The Lecturer's Guide includes the following:

- Comprehensive answers to all activities.
- Links to online materials to support teaching.
- A practice examination and memorandum.
- Photocopiable lesson plan templates.
- A suggested 10-week lesson and teaching plan.

TVET first author

M van Rensburg

Mathematics N4

This document includes important information about the revised curriculum for Mathematics N4, scheduled for implementation in 2022. For best results, use *TVET First Mathematics N4*.

Overview of main curriculum changes

- The Mathematics N4 syllabus has been revised and updated.
- All of the learning outcomes have been renumbered.
- Some of the learning outcomes have been reworded or broken down into more detail.
- The syllabus now comprises six modules instead of seven.
- The old Module 1 (Equations, manipulation and word problems) has been removed completely from this syllabus.
- The weighting of the following modules has been increased: 2 (Complex numbers), 5 (Differential calculus) and 6 (Integral calculus).
- In the new Module 1 (Determinants), students are specifically required to use row elimination to calculate second- and third-order determinants. In other words, students are now only required to use the co-factor expansion method to evaluate third order determinants. The diagonal expansion method is not required by the syllabus.
- In Module 5 (Differential calculus), the new syllabus specifically states that students must be able to sketch graphs indicating maximum and minimum values derived from the second derivatives of trigonometric functions, algebraic terms and polynomials (and points of inflection).
- In the new Module 6 (Integration), a new section on finding the areas bounded between two curves has been added to the syllabus. In the old curriculum, students needed to calculate the area bounded by a single curve and the x-axis only.
- The syllabus emphasises the fact that Mathematics N4 'strives to assist students to obtain trade-specific calculation knowledge', and that "problems should be based on real-world scenarios allowing students to relate theory to practice".

Changes to examination assessment

Old standards (1996)

Recall and reproduction	Understanding and application	Analysis, synthesis and evaluation
±30%	±40%	±30%

New standards (2022)

Remember	Understand	Apply	Analyse	Evaluate	Create
20%	20%	20%	10%	20%	10%

Mathematics N4

Old and new modules and weightings

- Old curriculum (1996)

Module 1	Equations, manipulation and word problems	12%
Module 2	Determinants	8%
Module 3	Complex numbers	10%
Module 4	Trigonometry	20%
Module 5	Sketch graphs	10%
Module 6	Limits and differentiation	20%
Module 7	Integration	20%
Total		100%

- New curriculum (2022)

Module 1	Determinants	8%
Module 2	Complex numbers	12%
Module 3	Trigonometry	20%
Module 4	Functions and graphs	10%
Module 5	Differential calculus	25%
Module 6	Integral calculus	25%
Total		100%

Detailed breakdown/comparison of changes to syllabus

- The old Module 1 (Equations, manipulation and word problems) has been removed completely.

Module 1: Determinants

Old weight 8%; new weight 8%

- Students are specifically required to use row elimination to calculate second and third order determinants. In other words, students are now only required to use the co-factor expansion method to evaluate third order determinants. The diagonal expansion method is not required by the syllabus.
- The new learning outcomes do not specifically require a definition of the co-factor of a minor.
- The module is otherwise unchanged.
- The module weighting remains the same.

Mathematics N4

Previous curriculum (1996)	New curriculum (2022)
Module 2: Determinants 7.2.1 Write simultaneous equations with either two or three variables in determinant notation and calculate the determinant. 7.2.2 Calculate determinants of the second and third order and apply Cramer's rule. 7.2.3 Identify and calculate the minor of a third order determinant. 7.2.4 Define and determine the co-factor of the minor.	Module 1: Determinants 8.1.1 Convert equations with either two or three variables into a determinant. 8.1.2 Calculate second and third order determinants using row elimination, followed by application of Cramer's rule. 8.1.3 State and calculate the minor of a third order determinant. 8.1.4 Determine the co-factor of the minor.

Module 2: Complex numbers

Old weight 10%; new weight 12%

- Students are now specifically required to define imaginary numbers, the conjugate, the modulus and the argument, and to identify the real and imaginary parts of a complex number in rectangular form.
- The module weight has increased by 2%.
- The module is otherwise unchanged.

Previous curriculum (1996)	New curriculum (2022)
Module 3: Complex numbers 7.3.1 Solve a quadratic equation with complex roots. 7.3.2 Convert a complex number from rectangular to polar form and vice versa, with the aid of a pocket calculator or the analytical method. 7.3.3 Add, subtract, multiply and divide complex numbers in any given form by first converting to the appropriate form mentioned in 7.3.2 for the required operation.	Module 2: Complex numbers 8.2.1 Define an imaginary number. 8.2.2 Identify real and imaginary parts of a complex number rectangular form. 8.2.3 Simplify complex powers. 8.2.8 Convert a complex number from rectangular to polar form and vice versa, using a pocket calculator or any analytical method. 8.2.4 Add, subtract and multiply complex numbers in rectangular form. 8.2.6 Divide complex numbers in rectangular form using the conjugate. 8.2.9 Multiply and divide complex numbers in polar form.

Mathematics N4

Previous curriculum (1996)	New curriculum (2022)
7.3.4 Determine the conjugate of a complex number and apply it in calculations.	8.2.5 Define and determine the conjugate of a complex number.
7.3.5 Represent a complex number on an Argand diagram, and also calculate and indicate the modulus and argument for the complex number on the Argand diagram.	8.2.7 Define the modulus and argument of the complex number and plot them on an Argand diagram.
7.3.6 State and apply De Moivre's theorem to products, quotients and power of complex numbers.	8.2.10 State and apply De Moivre's theorem to products, quotients and powers of complex numbers.
7.3.7 Solve complex equations. The second order equations solved in 7.3.7 must be based on algebraic or graphic methods mastered in N1 to N3 Mathematics.	8.2.11 Solve complex equations in rectangular or polar form.

Module 3: Trigonometry

Old weight 20%; new weight 20%

- The module weighting is unchanged.
- Special triangles are now mentioned.
- The module is otherwise unchanged.

Previous curriculum (1996)	New curriculum (2022)
Module 4: Trigonometry 7.4.1 Apply the concept of negative and positive angles to all the calculations relevant to this syllabus. 7.4.2 Apply the identities for $\sin(a \pm b)$, $\cos(a \pm b)$ and $\tan(a \pm b)$.	Module 3: Trigonometry 8.3.1 Calculate special triangles pertaining to the four quadrants. Apply the concept of negative and positive angles to all the calculations relevant to this syllabus. 8.3.2 Apply the notion of compound angles such as $\sin(a \pm b)$, $\cos(a \pm b)$ and $\tan(a \pm b)$. Apply the complementary angles specifically to trigonometric identities. Factorise different types of trigonometric equations including using identities.

Mathematics N4

Previous curriculum (1996)	New curriculum (2022)
<p>7.4.3 Derive the identities for $\sin(2a)$; $\cos(2a)$; $\tan(2a)$; $\sin \frac{1}{2}a$; $\cos \frac{1}{2}a$; $\tan \frac{1}{2}a$; $\sin^2 a = \frac{1}{2}(1 - \cos 2a)$; $\cos^2 a = \frac{1}{2}(1 + \cos 2a)$ from the identities in 7.4.2 above.</p>	<p>8.3.3 Derive the following identities: Compound angles $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$ $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$ $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \cdot \tan B}$ Double angles $\sin 2a = 2 \sin a \cos a$ $\cos 2a = \begin{cases} \cos^2 a - \sin^2 a \\ 2 \cos^2 a - 1 \\ 1 - 2 \sin^2 a \end{cases}$ $\tan 2a = \frac{2 \tan a}{1 - \tan^2 a}$ Half angles $\sin \frac{1}{2}a = \sqrt{\frac{1 - \cos a}{2}}$ $\cos \frac{1}{2}a = \sqrt{\frac{1 + \cos a}{2}}$ $\tan \frac{1}{2}a = \sqrt{\frac{1 - \cos a}{1 + \cos a}}$ $\sin^2 a = \frac{1}{2}(1 - \cos a)$ $\cos^2 a = \frac{1}{2}(1 + \cos a)$</p>
<p>7.4.4 Derive the co-ratios $\sin(90^\circ + \theta)$; $\cos(90^\circ + \theta)$ and $\tan(90^\circ + \theta)$ from identities in 7.4.2 and apply them.</p>	<p>8.3.4 Derive the co-ratios $\sin(90^\circ \pm \theta)$, $\cos(90^\circ \pm \theta)$ and $\tan(90^\circ \pm \theta)$.</p>
<p>7.4.5 Apply the identities mentioned in 7.4.2 to 7.4.4, as well as the square, invert and quotient identities, to solve trigonometric equations, simplify trigonometric expressions and prove trigonometric identities.</p>	<p>8.3.5 Apply the square, invert and quotient identities, and furthermore solve trigonometric equations, simplify trigonometric expressions and prove trigonometric identities.</p>

Module 4: Functions and graphs

Old weight 10%; new weight 10%

- This module was previously called 'Sketch graphs'.
- The module weighting is unchanged.
- Continuous and discontinuous functions are no longer mentioned in the new syllabus.
- Students are required to 'define' a domain and range rather than simply identifying them.
- The module is otherwise unchanged.

Mathematics N4

Previous curriculum (1996)	New curriculum (2022)
Module 5: Sketch graphs	Module 4: Functions and graphs
7.5.1 Identify the following from graphs and equations (no proofs required):	
7.5.1.1 Domain and range	8.4.1.1 Define domain and range.
7.5.1.2 Dependant and independent variable	8.4.1 Distinguish between a dependent and an independent variable.
7.5.1.3 Functions and relations	8.4.1.2 State the difference and distinguish between functions and relations.
	8.4.1.3 Identify the relevant functions and relations that relate to their graphs.
7.5.1.4 Points of symmetry with reference to an axis or the lines $y = \pm x$	8.4.1.4 Determine points of symmetry with reference to an axis or the lines $y = \pm x$.
7.5.1.5 Continuous and discontinuous functions	
7.5.1.6 Inverse functions and relations	8.4.1.5 Know what inverse functions and relations are.
7.5.2 Draw neat sketch graphs of the following functions/relations. Only critical values need to be indicated. No table of values or point-for-point plotting is required. Critical values may, where possible, be calculated with the aid of differentiation, after the module on differentiation has been completed.	8.4.2 Draw neat sketch graphs of the following functions or relations. Only critical values need to be indicated. No table of values or point-for-point plotting is required. Critical values may, where possible, be calculated with the aid of differentiation after the module on differentiation has been completed.
7.5.2.1 $ax + by + c = 0$	8.4.2.1 $ax + by + c = 0$
7.5.2.2 $x^2 + y^2 = r^2$; $y = \pm \sqrt{r^2 - x^2}$ and $x = \pm \sqrt{r^2 - y^2}$	8.4.2.2 $x^2 + y^2 = r^2$; $y = \pm \sqrt{r^2 - x^2}$; $x = \pm \sqrt{r^2 - y^2}$
7.5.2.3 $xy = c$	8.4.2.3 $xy = c$
7.5.2.4 $\frac{x^2}{a^2} \pm \frac{y^2}{b^2} = 1$	8.4.2.4 $\frac{x^2}{a^2} \pm \frac{y^2}{b^2} = 1$
7.5.2.5 $y = ka^{nx}$, $y = ke^{nx}$, $y = k \log_a(nx)$ and $y = k \log_e(nx)$	8.4.2.5 $y = ka^{nx}$, $y = ke^{nx}$, $y = k \log_a(nx)$ and $y = k \log_e(nx)$

Mathematics N4

Previous curriculum (1996)	New curriculum (2022)
<p>a) $y = ka^{nx}$ with $a > 1$ and a and n positive integers</p> <p>b) $y = ka^{nx}$ with $0 < a < 1$ rational and n a positive integer</p> <p>c) $y = k \log_e(nx)$ with n a positive integer</p> <p>d) $y = k \log_a(nx)$ with $a > 1$ and a and n positive integers</p> <p>e) $y = k \log_a(nx)$ with $0 < a < 1$ and a rational and n a positive integer</p>	<p>$y = ka^{nx}$ with $a > 1$ and a and n positive integers</p> <p>$y = ka^{nx}$ with $0 < a < 1$ rational and n a positive integer</p> <p>$y = k \log_e(nx)$ with n a positive integer</p> <p>$y = k \log_a(nx)$ with $a > 1$ and a and n positive integers</p> <p>$y = k \log_a(nx)$ with $0 < a < 1$ and a rational and n a positive integer</p>
<p>7.5.2.6 $y = a \sin(bx + c) + d$ $y = a \cos(bx + c) + d$ for $-\pi \leq x \leq \pi$</p>	<p>8.4.2.6 $y = a \sin(bx + c) + d$ $y = a \cos(bx + c) + d$ $y = a \tan(bx + c) + d$, for $-\pi \leq x \leq \pi$</p>
<p>7.5.2.7 $y = \operatorname{cosec} x$ $y = \sec x$ $y = \cot x$, for $-\pi \leq x \leq \pi$</p>	<p>8.4.2.7 $y = \operatorname{cosec} x$ $y = \sec x$ $y = \cot x$, for $-\pi \leq x \leq \pi$</p>
<p>7.5.2.8 $y = ax^2 + bx + c$</p>	<p>8.4.2.8 $y = ax^2 + bx + c$</p>
<p>7.5.2.9 $y = ax^3 + bx^2 + cx + d$ where a, b, c and d are integers</p>	<p>8.4.2.8 $y = ax^3 + bx^2 + cx + d$ where a, b, c and d are integers</p>
<p>Relating to 7.5.2, roots may also be calculated with the aid of the factor theorem and long division. The turning points and the point of inflection should be calculated with the aid of differentiation.</p>	

Module 5: Differential calculus

Old weight 20%; new weight 25%

- This module was previously called 'Limits and differentiation'.
- The weighting has increased by 5%.
- The new syllabus specifies that for the binomial theorem, students may only be examined for n values that are strictly positive natural numbers less than 4.
- The new syllabus specifically states that students must be able to sketch graphs indicating maximum and minimum values derived from the second derivatives of trigonometric functions, algebraic terms and polynomials (and points of inflection).
- The module is otherwise unchanged.

Mathematics N4

Old learning outcomes (1996)	Updated learning outcomes (2022)
Module 6: Limits and differentiation <p>7.6.1 Apply the theorems on limits to calculate simple limits of the form $\frac{0}{0}$ and $\frac{\infty}{\infty}$ by making use of the algebraic expressions and quotients (The theorem of L'Hospital may not be applied).</p> <p>7.6.2 Give the binomial theorem in general terms.</p> <p>7.6.3 Apply the binomial theorem with rational indices to expand a simple binomial to four terms.</p> <p>7.6.4 Define differentiation as rate of change and derive the expression $\lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$ or $\lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ from first principles with the aid of a sketch as an introduction to differentiation. $f(x)$ may only be in one of the following forms: $f(x) = ax^n + b$ with $ax^n + bx^{n-1} + cx^{n-2} + \dots$ and n a positive integer.</p> <p>7.6.5 Determine $\frac{dy}{dx}$ of the following standard forms: $y = k$ $y = kx^n$ $y = ka^x$ $y = ke^x$ $y = k \ln x$ $y = k \log_a x$ $y = k \sin x$ $y = k \cos x$ $y = k \tan x$ $y = k \cot x$ $y = k \sec x$ $y = k \operatorname{cosec} x$</p>	Module 5: Differential calculus <p>8.5.1 Calculate limits that are indeterminate: $\frac{0}{0}$ and $\frac{\infty}{\infty}$ by making use of algebraic expressions and quotients. (The theorem of L'Hôpital may not be applied.)</p> <p>8.5.2 Use the binomial theorem in general terms.</p> <p>8.5.3 Apply the binomial theorem with rational indices to expand a simple binomial to four terms.</p> <p>8.5.4 Define differentiation as a rate of change and derive the expression $\lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$ or $\lim_{h \rightarrow 0} \frac{f(x + h) - f(x)}{h}$ from first principles with the aid of a sketch as an introduction to differentiation. $f(x)$ may be in one of the following forms only: $f(x) = ax^n + b$ with $ax^n + bx^{n-1} + cx^{n-2} + \dots$ and n a positive integer. A student may be examined ONLY for n A STRICTLY POSITIVE NATURAL NUMBER LESS THAN 4.</p> <p>8.5.5 Determine $\frac{dy}{dx}$ of the following standard forms: $y = k$ $y = kx^n$ $y = ka^x$ $y = ke^x$ $y = k \ln x$ $y = k \log_a x$ $y = k \sin x$ $y = k \cos x$ $y = k \tan x$ $y = k \cot x$ $y = k \sec x$ $y = k \operatorname{cosec} x$</p>

Mathematics N4

Old learning outcomes (1996)	Updated learning outcomes (2022)
<p>7.6.6 Determine the chain rule to a function of a function to determine the first derivatives of $y = ka^{nx}$; $y = ke^{nx}$; $y = k \log_a nx$; $y = k \log_e nx$; $k \sin(bx)$; $y = k \cos(bx)$; $y = k \tan(bx)$; $y = k \cot(bx)$; $y = k \sec(bx)$ and $y = k \operatorname{cosec}(bx)$.</p> <p>7.6.7 Apply the derivatives in 7.6.5 and 7.6.6 to find the first derivatives of polynomials.</p> <p>7.6.8 Apply the product and quotient rules for differentiations to differentiate simple products and quotients. Combinations of chain, product and quotient rules may not be asked.</p> <p>7.6.9 Determine the second derivatives of trigonometric functions and algebraic terms and polynomials with the exceptions in 7.6.8 and apply it to determine maximum and minimum turning points and points of inflection for the graphs in Module 5.</p>	<p>8.5.6 Apply the chain rule to determine the first derivatives of $y = ka^{nx}$; $y = ke^{nx}$; $y = k \log_a nx$; $y = k \log_e nx$; $k \sin(bx)$; $y = k \cos(bx)$; $y = k \tan(bx)$; $y = k \cot(bx)$; $y = k \sec(bx)$; and $y = k \operatorname{cosec}(bx)$.</p> <p>8.5.7 Apply the product and quotient rules for the differentiation of simple products and quotients. Combinations of chain, product and quotient rules may not be asked.</p> <p>8.5.8 Determine the second derivatives of trigonometric functions, algebraic terms and polynomials to determine maximum and minimum turning points and points of inflection for the functions in this syllabus.</p> <p>8.5.9 Sketch graphs indicating maximum and minimum values derived in 8.5.8.</p>

Module 6: Integral calculus

Old weight 20%; new weight 25%

- The weighting of this module has increased by 5%.
- A new section on finding the areas bounded between two curves has been added to the syllabus. In the old curriculum, students only needed to calculate the area bounded by a single curve and the x-axis.
- The module is otherwise unchanged.

Old learning outcomes (1996)	Updated learning outcomes (2022)
<p>Module 7: Integration</p> <p>7.7.1 Understand the concept of integration as a summation function (definite integral) and as the converse of differentiation (indefinite integral).</p>	<p>Module 7: Integral calculus</p> <p>8.6.1 Understand the concept of integration as a summation function (definite integral) and as a process of anti-differentiation (indefinite integral).</p>

Mathematics N4

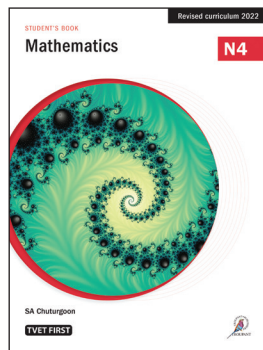
Old learning outcomes (1996)	Updated learning outcomes (2022)
<p>7.7.2 Apply standard forms of integrals as the converse of differentiation.</p> <p>7.7.3 Integrate the following functions:</p> <p>7.7.3.2 kx^n, n real with $n \neq -1$</p> <p>7.7.3.2 $\frac{k}{x}$; ka^{nx}; ke^{nx}, with $a \geq 0$, $k, n \in \mathbb{R}$</p> <p>7.7.3.3 $k \sin(bx)$ and $k \cos(bx)$ with b and $k \in \mathbb{R}$</p> <p>7.7.4 Integrate polynomials consisting of terms of the above forms.</p> <p>7.7.5 Calculate definite integrals of functions as specified in 7.7.2 to 7.7.4.</p> <p>7.7.6 Apply integration to determine the magnitude of an area included by a curve and the x-axis, or by a curve, the x-axis and the ordinates $x = a$ and $x = b$, where a and b are integers. The graphs are limited to those given in Module 5 and those functions that can be integrated with N4 knowledge of integration.</p>	<p>8.6.2 Apply standard forms of integrals as a process of anti-differentiation.</p> <p>8.6.3 Integrate functions given on the formula sheet.</p> <p>8.6.3.1 kx^n, n real with $n \neq -1$</p> <p>8.6.3.2 $\frac{k}{x}$; ka^{nx}; ke^{nx}, with $a \geq 0$, $k, n \in \mathbb{R}$</p> <p>8.6.3.3 $k \sin(bx)$ and $k \cos(bx)$ with b and $k \in \mathbb{R}$</p> <p>8.6.4 Integrate polynomials consisting of terms of the above forms.</p> <p>8.6.5 Apply integration to determine the magnitude of an area included by a curve and the x-axis, or by a curve, the x-axis and the ordinates $x = a$ and $x = b$, where a and b are integers. The graphs are limited to those given in Module 4 and those functions that can be integrated with N4 knowledge of integration.</p>
<p>The area may as a whole be above the x-axis or below the x-axis or partly above and partly below the x-axis</p>	<p>8.6.6 Use the definite integral with two limits to calculate the area bounded by the graph, the x-axis and values given to define the area. Areas include areas above the x-axis, areas below the x-axis, and joined areas above and below the x-axis.</p> $A = \int_a^b y \, dx \text{ or } A_{\text{total}} = \int_a^b y \, dx + \int_c^d y \, dx$ <p>8.6.7 Calculate intersection points of two curves, and sketch the two graphs on the same system of axes, indicating the area bounded by the two intersection points calculated and showing the representative strip used to calculate the area.</p>

Mathematics N4

Old learning outcomes (1996)	Updated learning outcomes (2022)
<p>With reference to 7.7.6, the area must be determined as follows:</p> <ul style="list-style-type: none"> A neat rough sketch of the relevant curve must be drawn and the area to be found clearly indicated. The representative strip and the limits of the area must be indicated. The equation for the area of the representative strip must be written down as $\Delta A = y\Delta x$. The total area must then be written down in the form of the correct definite integral. 	<p>The function and representative strip shall be limited to $y = f(x)$ and will be along the direction of Δx only. $x = f(y)$ and Δy is not applicable nor examinable in this syllabus.</p> <p>A neat rough sketch of the relevant curve must be drawn and the area to be found clearly indicated. The representative strip, dx and the limits of the area must be indicated.</p>

Mathematics N4–N6: Pick the course that works best for you

We understand that individual teaching and learning styles differ. That's why we have developed three different series of *TVET First Mathematics* textbooks, each with a distinctive approach. Each is excellent. Each prepares students for exam success. Choose the course that works best for you.

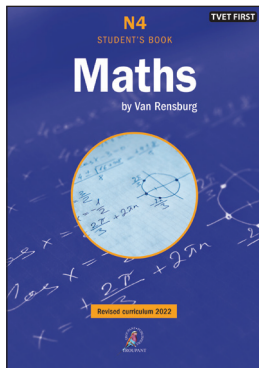


Mathematics (SA Chuturgoon and JV John)

This full-colour Student's Book is a complete course between two covers, offering extensive explanations of all the required content. It is full of real-world engineering applications so students gain a clear grasp of the mathematical theory, as well as a solid grounding in how to apply it in an engineering context. It provides a range of study aids, from mnemonics to help students memorise important information to graded worked examples that cater to a wide spectrum of students.

Mathematics is ideal for the following:

- All students enrolled for Mathematics N4, N5 and N6.
- Students who prefer scaffolded content and varied practice to assist them in preparing for examinations.
- Lecturers who teach large, mixed-ability classes and who want an all-inclusive resource that students can use to study at their own pace.
- Distance-learning students who need a comprehensive book for successful self-study.



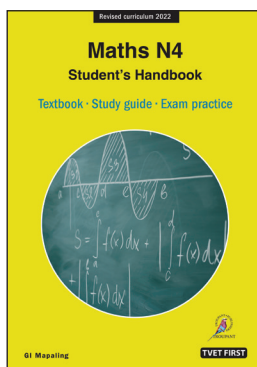
Maths by Van Rensburg (MJJ van Rensburg)

This tried and trusted series has been thoroughly revised and updated to cover the latest curriculum requirements. Clear and concise, the book is an effective and proven learning tool that offers to-the-point explanations, varied activities covering the full range of examination requirements and extension activities for students seeking enrichment. The series teaches students to apply their knowledge, not simply memorise it.

- While all necessary formulae are covered, this series is focused on understanding and application.
- The series was written by a subject expert with 35 years of lecturing experience.
- The Lecturer's Guide includes complete solutions to all the activities.

Maths by Van Rensburg is ideal for the following:

- Students who want to consolidate their knowledge of the basics of mathematics quickly and easily.
- Stronger students looking for extension and enrichment activities.
- Lecturers who like to work with alternative methods to cater for different learning styles.
- Lecturers who have enjoyed a previous edition of *Maths by Van Rensburg* and know that it works for them.



Maths Student's Handbook (GI Mapaling)

Get straight to the point with a practical, hands-on approach. This essential series provides a targeted approach to understanding mathematics problems with step-by-step explanations and guidance in applying knowledge. Students can gain vital insights into where they make mistakes by checking their work using the full solutions at the back of each book.

The books aim to help students to do the following:

- Analyse the question.
- Select the method and tools needed to solve the question.
- Apply the method.

The Maths Student's Handbook is ideal for the following:

- Students who are studying mostly on their own and need everything in one comprehensive, hands-on guide.
- Students who are using another core textbook, but need more practical application and help with their technique.
- Students who want a significant improvement in their results, whether from a 'fail' to a 'pass' or from 'very good' to 'excellent'.
- Lecturers who want to help students take responsibility for their learning.

Building Administration N5

Overview of main curriculum changes

- The syllabus for Building Administration N5 has been fully reworked and updated.
- It has been restructured and reordered, and it is now broken into eight weighted modules with learning content and detailed learning outcomes.
- Both the learning content and the learning outcomes have been completely reworded, and much more detail has been provided for all sections.
- Contract documents have been incorporated into a more comprehensive new module called 'Earnings and expenditure' (Module 1).
- There is a new module on support structures (Module 5).
- Variations, omissions and handing over have been combined into one module (Module 7).
- There is a new module on statutory bodies (Module 8).
- Three of the modules from the old syllabus – Module 2 (Progress charts and schedules), Module 4 (Materials) and Module 6 (Administration and personnel) – have been removed.
- The aims of the new syllabus are to give students a thorough background in the administration of a construction site as well as to develop their ability to manage construction sites. In addition, it seeks to ensure they have a good understanding of industry regulations, and adhere to all prescribed safety standards and procedures.

Structure and weighting changes

Previous syllabus (1981)

Old curriculum modules (no weighting given)	
1.	Mechanical plant
2.	Progress charts and schedules
3.	Subcontractors
4.	Materials
5.	Handing over of completed work
6.	Administration and personnel
7	Contract documents
8.	Mass haul programme
9.	Variations, omissions and extras
10.	Site meetings

Building Administration N5

New syllabus (2022)

New curriculum modules	Weighting
1. Earnings and expenditures	10
2. Main contractors and subcontractors	10
3. Site meetings and site records	10
4. Mechanical plants	15
5. Support to structures	10
6. Mass haul diagrams	20
7. Variations, omissions and handing over	10
8. Regulatory bodies	15
Total	100

Detailed curriculum changes

Previous curriculum (1981)	New curriculum (2022)
Module 7: Contract documents Types of contract documents Uses of: <ul style="list-style-type: none"> • Drawings • Specifications • Bills of quantities • Tender documents 	Module 1: Earnings and expenditures 1.1 Earnings 1.1.1 Explain the income sources of a contractor: <ul style="list-style-type: none"> • Preliminaries • Measured works • Day works • Nominated materials • Variations 1.2 Expenditures 1.2.1 Explain the various expenditures of a contract: <ul style="list-style-type: none"> • Site overheads • Materials • Plants • Labour • Extras • Subcontractors
Module 3: Subcontractors Coordinating the work of the subcontractors or specialists	Module 2: Main contractors and subcontractors 2.1 Pre-tender responsibilities

Building Administration N5

Previous curriculum (1981)	New curriculum (2022)
<p>Supervision and coordination of various trades</p> <p>Provision of special facilities, scaffolding, etc.</p> <p>Allocation of storage space</p>	<p>2.1.1 Explain the roles and responsibilities of a contractor in the pre-tender stage:</p> <ul style="list-style-type: none"> • Pre-tender meetings • Tender preparation • Site investigation <p>2.2 Contract responsibilities</p> <p>2.2.1 Explain the roles and responsibilities of a contractor in terms of:</p> <ul style="list-style-type: none"> • Rights and responsibilities • Finance • Selection of subcontractors • Responsibilities to the subcontractor <p>2.3 Subcontractor responsibilities</p> <p>2.3.1 Explain the roles and responsibilities of a subcontractor:</p> <ul style="list-style-type: none"> • Responsibilities • Finance
<p>Module 10: Site meetings</p> <p>Reasons for the necessity of meetings</p> <p>Procedure to follow during the handling of a contract</p> <p>Typical items for discussion at site meetings</p> <p>Recording of instructions issued at meetings</p>	<p>Module 3: Site meetings and site records</p> <p>3.1 Site meetings</p> <p>3.1.1 Explain how to schedule a site meeting:</p> <ul style="list-style-type: none"> • Reasons • Notions • Agenda • Procedures • Attendees • Minutes <p>3.2 Records</p> <p>3.2.1 Explain the contents of the following site records:</p> <ul style="list-style-type: none"> • Site diary • Labour records • Weather records • Hold-ups • Visitors record • Material record

Building Administration N5

Previous curriculum (1981)	New curriculum (2022)
<p>Module 1: Mechanical plant required for building work</p> <p>Types of plant for levelling, excavating, loading, mixing and compacting</p> <p>Selection of mechanical plant for various purposes</p> <p>Brief description of plant and utilisation</p> <p>Sequence utilisation, maintenance and servicing</p>	<p>Module 4: Mechanical plants</p> <p>4.1 Plant and cranes</p> <p>4.1.1 Describe the functions and the magnitude of various plants:</p> <ul style="list-style-type: none"> • Concrete mixing plants • Stone crushing plants • Bitumen mixing plants • Types of cranes and uses <p>4.2 Selection of plant and equipment</p> <p>4.2.1 Select the appropriate machinery for the project considering the following:</p> <ul style="list-style-type: none"> • Economy • Volume of the job • Capacity of the plant • Sufficient attendance <p>4.3 Maintenance</p> <p>4.3.1 Explain the importance of the maintenance of equipment:</p> <ul style="list-style-type: none"> • Maintenance of plant and equipment • Planned maintenance • Preventative maintenance • Maintenance checklist
	<p>Module 5: Support to structures</p> <p>5.1 Excavations</p> <p>5.1.1 Explain the excavation of trenches:</p> <ul style="list-style-type: none"> • Cause of collapse of trenches • Preventing trench collapse • Planking and strutting on various kinds of soil <p>5.2 Shoring</p> <p>5.2.1 Draw and identify various types and uses of shoring:</p> <ul style="list-style-type: none"> • Raking shores • Dead shores • Flying shores • Double flying shores

Building Administration N5

Previous curriculum (1981)	New curriculum (2022)
	5.3 Underpinning 5.3.1 Explain the use of underpinning: <ul style="list-style-type: none"> • Enlarging concrete footings • Jacked piles
Module 8: Mass haul programme Determining of cut and fill economically for given plotted ground surface shapes (using Simpson's rule)	Module 6: Mass haul diagrams 6.1 Mass haul diagram 6.1.1 Illustrate the use of mass haul diagrams after calculation of earth work quantities: <ul style="list-style-type: none"> • Formation level • Grade • Mass haul diagram • Cut and fill 6.2 Cut and fill 6.2.1 Use calculations to determine the cut and fill for given plotted ground surface shapes: <ul style="list-style-type: none"> • Simpson's rule • Middle ordinate method 6.3 Accumulated volume 6.3.1 Calculate the accumulated volumes from the given data: <ul style="list-style-type: none"> • Cross section areas and volumes • Accumulated volume
Module 9: Variations, omissions and extras Definitions Effects on efficiency, progress and costs involved in handling a building contract Variation order day book Day works Additional works	Module 7: Variations, omissions and handing over 7.1 Variations 7.1.1 Explain in which scenario each of the following can be used: <ul style="list-style-type: none"> • Variations • Day works • Omissions • Extras • Additional works

Building Administration N5

Previous curriculum (1981)	New curriculum (2022)
<p>Module 5: Handing over of completed work</p> <p>Explain the procedures in handing over a completed project:</p> <ul style="list-style-type: none"> • Defects liability • Cleaning • Security arrangements • Removal of plant • Removal of huts, sheds and office equipment 	<p>7.2 Handing over</p> <p>7.2.1 Explain the procedures and responsibilities to be followed in handing over a project:</p> <ul style="list-style-type: none"> • Practical completion certificate • Handing over • Maintenance • Defects liability
	<p>Module 8: Regulatory bodies</p> <p>8.1 Building regulations</p> <p>8.1.1 Explain the need for building regulations in terms of:</p> <ul style="list-style-type: none"> • Control • Standardisation • Quality <p>8.2 Statutory bodies</p> <p>8.2.1 Explain the importance of adhering to the regulations and processes of the following:</p> <ul style="list-style-type: none"> • Regulatory bodies • Trade organisations <p>8.3 Government acts</p> <p>8.3.1 Explain the importance of adhering to the Labour Acts</p> <p>8.4 Construction Industry Regulatory Bodies</p> <p>8.4.1 Explain the functions of the following regulatory bodies:</p> <ul style="list-style-type: none"> • Need for regulators • CIDB • NHBRC • SACPCMP • ECSA • SACAP • SACOSP • SABS • SANS • Local authorities

Building Administration N5

Previous curriculum (1981)

Not in the new syllabus:

Module 2: Progress charts and schedules

Types of progress charts and schedules
Methods of recording on charts
Mechanical equipment and plant loading schedules

Module 4: Materials

Methods of ordering, storage, control, issue and crediting of materials

Module 6: Administration and personnel

Introduction to the principles of administration
Effects of efficient site administration upon production:

- Formulating site policies and duties
- Delegation of responsibilities
- Personal contacts on the site
 - Employer
 - Building owner
 - Local authority officials etc.

Qualifications and personal characteristics required in foreman and supervisors

Features and benefits of TVET First Building Administration N5

TVET First is just the textbook to guide Building Administration students towards success in their studies. This high-quality Student's Book includes practical advice from a practising building professional. It is packed with features that take students through the complete curriculum and prepare them for examination success:

- Clear and simple writing with explanations of new terminology.
- A simple, step-by-step approach to problem solving.
- Plenty of varied activities to consolidate students' knowledge and prepare them for examinations.
- Lots of photographs and clear diagrams to make learning easy.
- Case studies that link the content and activities to real-life situations.
- Summaries at the end of each module to help with revision.
- Summative assessments modelled on examinations to provide helpful examination practice.

TVET First author

B Afrika

Building and Structural Construction N5

Overview of main curriculum changes

- The syllabus for Building and Structural Construction N5 has been fully reworked and updated.
- It has been completely restructured and is now broken into seven weighted modules with learning content and numbered learning outcomes.
- Both the learning content and the learning outcomes have been completely reworded, and much more detail has been provided for all sections.
- Beams and floor coverings have been combined into one module (Module 3: Reinforced concrete beams and slab).
- Module 5 (Bending schedule) and Module 6 (Structural steelwork) are new modules.
- The new Module 7 (Design work) incorporates modules 1, 2, 3 and 4 of the old Section B (Design work).
- Module 5 (Balcony design) of the 'Design work' section of the old syllabus has been removed.
- The general construction of steel fire escapes for two-storey buildings is no longer mentioned in the discussion of staircases in Module 4 (this content was previously covered in Module 5). In addition, wooden staircases are no longer specifically mentioned in the syllabus (in other words, the reference to a welded steel frame structure with wooden stairs for a straight step arm has been removed).
- The aims of the new syllabus are to give students a thorough background knowledge of the theory and methodology applied in building and structural construction, to introduce them to the application of technological principles and practices in the building and structural construction industry, and to provide them with the knowledge and skills used for structural design in the industry.

Structure and weighting changes

Previous syllabus (1981)

Section	Old curriculum modules (no weighting given)
A Drawing (reinforced concrete and steel)	1. Foundations (reinforced concrete)
	2. Columns (reinforced concrete and steel)
	3. Sheet metal (reinforced concrete) and floor coverings
	4. Beams (reinforced concrete)
	5. Stairs (reinforced concrete, steel and wood)
B Design work	1. Bending moment and shear force diagrams
	2. Frame structures
	3. Bolted and riveted joints for frames
	4. Centre of gravity and moment of inertia
	5. Balcony design

Building and Structural Construction N5

New syllabus (2022)

New curriculum modules	Weighting
1. Reinforced concrete foundations	05
2. Reinforced concrete columns	10
3. Reinforced concrete beams and slab	10
4. Staircases (reinforced concrete and steel)	15
5. Bending schedules	15
6. Structural steelwork	15
7. Design work	30
Total	100

Detailed curriculum changes

Previous curriculum (1981)	New curriculum (2022)
<p>PART A: DRAWING</p> <p>Students must be able to show a good understanding of the drawing rules, with special insight into the permissible sizes of reinforcing bars (minimum and maximum) as well as the positions where they are located in the concrete.</p> <p>Module 1: Foundations (reinforced concrete)</p> <p>Construction, uses and shapes of:</p> <ul style="list-style-type: none"> Continuous ground beams Cantilevered foundations Column foundations 	<p>Module 1: Reinforced concrete foundations</p> <p>On completion of this module, the student should be able to explain, illustrate and design a suitable foundation for different building circumstances.</p> <p>1.1 Types of foundations</p> <p>1.1.1 Illustrate the following types of foundations by means of neat, labelled drawings (front and/or isometric views):</p> <ul style="list-style-type: none"> Raft foundation with edge thickening or edge beam or flat slab Cantilever attached to a column Isolated pad and column foundation Reinforced concrete stub columns

Building and Structural Construction N5

Previous curriculum (1981)	New curriculum (2022)
<ul style="list-style-type: none"> Foundations on reinforced concrete pillars Composite foundations 	<ul style="list-style-type: none"> Piles with pile caps for two piles, three piles and four piles Deep strip Grillage (no reinforcement) <p>Note: Where applicable, show the positions of the required reinforcement.</p> <p>1.2 Concrete grade and cover</p> <p>Explain concrete grade and cover as stipulated in SANS 2001-CC1-2017 Table 3 (cover for various exposure conditions) by means of a sketch</p> <p>1.3 Reinforcements</p> <p>Name, identify and explain the characteristics of the following reinforcement bars with referencing and their sizes:</p> <ul style="list-style-type: none"> Plain round mild steel bars High-yield deformed steel bars (Reference: SANS 10 144 – 2012)
<p>Module 2: Columns (reinforced concrete and steel)</p> <p>Construction assemblies (vertical and horizontal sections) of square, rectangular and round columns with deep or shallow reinforced appropriate foundations</p>	<p>Module 2: Reinforced concrete columns</p> <p>On completion of this module, the student should be able to understand the construction for the positioning of reinforcement for the different types of columns.</p> <p>2.1 Types of reinforced concrete columns</p> <p>Draw the horizontal and vertical sections through the following types of reinforced concrete columns to scale:</p> <ul style="list-style-type: none"> Square Rectangular Circular Hexagonal Octagonal L-shaped U-shaped <p>Note: Show the reinforcement cover clearly.</p>

Building and Structural Construction N5

Previous curriculum (1981)	New curriculum (2022)
Round joints with helical binder steel	<p>2.2 Concrete columns</p> <p>Draw neat, labelled vertical sections through a concrete column to show the following:</p> <ul style="list-style-type: none"> • Method of securing a column steel cage to the starter bars • Method of laying starter bars to the base • Method of positioning helical binders, rectangular or square binders (stirrups) and reinforcement cover • Position of the column concrete kicker
<p>Module 3: Slabs (reinforced concrete) and floor coverings</p> <p>Construction composition of the reinforcing bars for slabs carried in one or two directions on walls or beams, simply supported and with overhang</p>	<p>Module 3: Reinforced concrete beams and slabs</p> <p>On completion of this module, the student should be able to understand the process used in the construction of concrete beams and slabs, and the positioning of reinforcement steel positioning.</p> <p>3.1 Types of slabs</p> <p>3.1.1 Draw neat, labelled plan views of slabs that are supported in one or two directions on walls and concrete beams for each of the following:</p> <ul style="list-style-type: none"> • Simply supported slabs • Two-directional slabs <p>3.1.2 Draw neat, labelled longitudinal sectional views through simply supported beams and cantilever beams and slabs showing the following:</p> <ul style="list-style-type: none"> • Main reinforcement (high-yield or mild steel) • Secondary reinforcement (high-yield or mild steel) • Concrete cover • Spacing of bars • Bent-up requirements

Building and Structural Construction N5

Previous curriculum (1981)	New curriculum (2022)
<p>Types of floor coverings used for sheet metal work and methods of fixing (cement tiles, brick tiles, slate, glazed tiles, thermoplastic tiles, PVC tiles, wooden blocks and wooden planks with tongue-and-groove joints)</p> <p>Module 4: Beams (reinforced concrete)</p> <p>Longitudinal and cross-sections of the construction of beams with rectangular, T- and L-profiles that are simply supported at both ends</p>	<p>3.1.3 Draw neat, labelled longitudinal sectional views through simply supported slabs showing the following floor finishes:</p> <ul style="list-style-type: none"> • Cement tiles • Brick tiles • Slates • Thermoplastic (PVC) tiles • Wood blocks • Clay tiles • Tongue-and-groove strip flooring <p>3.1.4 Draw isometric views to show the layout of flooring from above</p> <p>3.2 Types of beams</p> <ul style="list-style-type: none"> • Draw neat scale drawings of the longitudinal vertical sectional views through the following beams: • Rectangular beam built into brick wall • T-beam • L-beam or edge beam <p>Note: Show the position of all the reinforcement.</p>
<p>Module 5: Stairs (reinforced concrete, steel and timber)</p> <p>Reinforced concrete: Top views and vertical sections of stairs to clearly show the reinforcement bar positions and construction for stairs that are laterally supported with or without supporting beams</p> <p>The straight flight and spiral staircase</p> <p>Bending schedules of the steelwork</p>	<p>Module 4: Staircases (reinforced concrete and steel)</p> <p>On completion of this module, the student should be able to understand the composition of different types and designs of staircases.</p> <p>4.1 Reinforced concrete staircase</p> <p>4.1.1 Explain the following terminology commonly used in staircases: Staircase or flight, stairwell, step, tread, riser, rise, open riser, going, waist, pitch, pitch line, nosing, landing, stringer, balustrade, baluster</p> <p>4.1.2 Draw neat line drawings of the top views of the following types of staircases, including the landing(s):</p> <ul style="list-style-type: none"> • Straight flight • Half turn

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Previous curriculum (1981)	New curriculum (2022)
<p>Stairs must be provided with balustrades of steel or steel and glass</p> <p>Removed from the syllabus:</p> <p>Steel: General construction of fire escapes for two-storey buildings</p> <p>Wood: Welded steel frame structure with wooden stairs for a straight step arm</p>	<ul style="list-style-type: none"> • Quarter turn • Traverse • Open well • Closed well • Spiral <p>4.1.3 Draw longitudinal sectional views of the following types of staircases, including the landing(s), to scale:</p> <ul style="list-style-type: none"> • Detail at the foot with or without edge beam • Detail at the top of the landing with or without an edge • Detail from the top of the landing with steps going up <p>Note: With or without steel balustrade</p> <p>4.1.4 Draw detail at the start of a staircase to show the starter bars in the floor slab and edge beam</p> <p>4.2 Steel staircase</p> <p>4.2.1 Draw the following longitudinal views of a steel staircase to scale:</p> <ul style="list-style-type: none"> • The steps attached to the inside of a steel channel stringer by means of rolled steel angles welded to the stringer • Three steps at the start of the stair • Four steps ending at a landing with stanchion circular tubular balustrade bolted to the top of the channel stringer <p>4.2.2 Explain fixing details of balustrades</p>

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Previous curriculum (1981)	New curriculum (2022)
<p>From Module 4: Beams (reinforced concrete)</p> <p>Bending schedules of reinforcing steel for beams with rectangular profiles only</p>	<p>Module 5: Bending schedules</p> <p>On completion of this module, the student should be able to read and compile a bending schedule.</p> <p>Use SANS 10144 (2012) as a guide.</p> <p>5.1 Bending schedules</p> <p>5.1.1 Interpret the following range:</p> <ul style="list-style-type: none"> • Rectangular beam • Rectangular beam with singular column • Column base and stub column • Slab <p>5.1.2 Interpret with reference to SANS 282: 2004 for the summary of the shape codes</p> <p>5.1.3 Identify and categorise the details of a completed reinforced bending schedule with a clear understanding of the sections listed:</p> <ul style="list-style-type: none"> • Member (number of member) • Bar mark • Type and size of reinforcement • Number of members • Number of bars in each member • Total number of bars • Length of each bar • The shape code • Dimensions of individual lengths (SANS 282) <p>5.2 Symbols used on layout plans</p> <ul style="list-style-type: none"> • Identify the following symbols: • ABR, ALT, B, B1, B2, B3, EF, EW, STG, T, T1, T2, T3, TOG
	<p>Module 6: Structural steelwork</p> <p>On completion of this module, the student should be able to understand the different types of welding symbols and bolts used in the connection of structural steel members.</p>

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Previous curriculum (1981)	New curriculum (2022)
	<p>6.1 Welding symbols</p> <p>Identify and sketch welding symbols with reference to the following:</p> <ul style="list-style-type: none"> • Construction of a welding symbol (indicate arrow side and other side) • Fillet, square groove, bevel groove, double bevel, Vgroove, J-groove, U-groove, weld-all-around, weld on site, weld-all-around on site <p>Note: Refer also to <i>Structural Steel Detailing: The Yellow Book</i>.</p> <p>6.2 Types of structural steel members and their uses</p> <p>List and describe (with the aid of neat drawings) the following types of structural steel members:</p> <ul style="list-style-type: none"> • I-section parallel flange • H-section parallel flange • Circular hollow section (CHS) • Square hollow section (SHS) • Channels • Rolled steel angles • Gusset plate and end plates • Base plates • Rivets and bolts <p>6.3 Bolts</p> <p>Explain and sketch rivets in the following context:</p> <ul style="list-style-type: none"> • Conical • Snap head/cup head • Pan head • Flat countersunk <p>Explain and sketch bolts in the following context:</p> <ul style="list-style-type: none"> • Class 4.8 ordinary; Class 8.8 ordinary • Class 10.9S high-strength friction grip bolts

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Previous curriculum (1981)	New curriculum (2022)
<p>From Module 2: Columns (reinforced concrete and steel)</p> <p>Steel columns of I-profiles, H-profiles, square tubular steel and pipes with pointed or riveted pedestals (with button plates) on reinforced concrete foundations that are fastened with foundation bolts</p>	<ul style="list-style-type: none"> • Class 8.8S high-strength friction grip bolts <p>6.4 Scale drawings</p> <p>6.4.1 Draw isometric views of an H-profile column and an I-beam showing the beam to column connections:</p> <ul style="list-style-type: none"> • With or without rolled steel angles, flange plates, base plates with holes and holding down bolts • Beam to beam connections • Welded and/or bolted <p>6.4.2 Draw first and/or third angle orthographic projection:</p> <p>Base plate connections, H-profile columns and concrete bases, showing the position of holes, with or without flange plates, rolled steel angles and holding-down bolts; welded and/or bolted</p>
<p>PART B: DESIGN WORK</p> <p>Module 1: Bending moment and shear force diagrams</p> <p>Bending moment and shear force diagrams of simply supported beams with and without overhang with point loads, distributed loads, and combined point and distributed loads</p>	<p>Module 7: Design work</p> <p>On completion of this module, the student must be able to design a tension steel beam, calculate the centroid of a lamina.</p> <p>7.1. Steel beam design</p> <p>7.1.1 Determine the following:</p> <p>Calculate the reactions at the supports of a simply supported steel beam with point loads and uniformly distributed load (UDL)</p> <ul style="list-style-type: none"> • Calculate the shear forces and bending moments • Draw the shear forces and bending moments • Determine the shear force and bending moment maximums <p>7.2 Maximum bending and shear stress:</p> <ul style="list-style-type: none"> • Calculate the maximum bending and shear stress

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Previous curriculum (1981)	New curriculum (2022)
<p>Module 2: Frame structures</p> <p>Force diagrams of loaded frame structures and calculations of forces exerted in parts of frames, including wind loads</p>	<ul style="list-style-type: none"> From the steel tables (BOE 8/2), select the smallest suitable I parallel or taper flange for the steel beam
<p>Module 4: Centre of gravity and moment of inertia</p> <p>Calculation of the centre of gravity and moments of inertia of simple composite steel sections of standard profiles</p>	<p>7.3 Frames</p> <p>7.3 Determine the values of the following for a frame:</p> <ul style="list-style-type: none"> The upward reaction force of the two reactions; including the angle to the horizontal. Use the analytical or graphical method to determine the magnitude and type of the forces in the frame. Tabulate the answer in table form. <p>7.4 The centroid and second moment of area:</p> <ul style="list-style-type: none"> Calculate the centroid of lamina in various shapes, including squares, rectangles, triangles and circles, building from symmetrical into unsymmetrical sections Calculate the total area Calculate the position of the neutral axis Calculate the value of the section modulus Calculate the maximum bending moment
<p>Module 3: Bolted and riveted joints for frames</p> <p>Design of rag seams, studs, welds and button plates for roof frames of bolted and/or riveted construction</p>	<p>7.5 Riveted connections</p> <p>7.5.1 Calculate the following typical riveted connections:</p> <ul style="list-style-type: none"> Lap joint Butt joint with one cover strip Butt joint with double strap Tie bars in gusset plates Half-lap joint for cylindrical vessels

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Previous curriculum (1981)	New curriculum (2022)
<p>Module 5: Balcony design (Removed from syllabus)</p> <p>Simple design of steel beams of standard steel profiles and simple composite sections, simply supported at the ends, for either point or uniformly distributed loads</p>	<p>7.5.2 Calculate the resistance force for the following:</p> <ul style="list-style-type: none"> • Shear stress or diameter in bolts • Tie bars in tearing • Bolts to crushing or bearing • Determine the maximum force that the joint will withstand

Features and benefits of *TVET First Building and Structural Construction N5*

TVET First is just the textbook to guide Building and Structural Construction students towards success in their studies. Written by a team of industry professionals and experienced TVET College lecturers, this Student's Book will not only ensure students' examination success, but will also prepare them for their future careers in industry.

The Student's Book has the following features:

- Easy to follow with clear explanations written in accessible language
- Clear, contextualised definitions of all new terminology
- A simple, step-by-step approach to drawing new components
- Varied activities that consolidate students' knowledge
- Links to relevant videos to enhance understanding
- Numerous photographs and clear diagrams to aid understanding
- Module summaries that help with revision
- Summative assessments modelled on examination questions that provide examination preparation and practice.

TVET First authors

S Skinner & C Knight

Mathematics N5

Overview of main curriculum changes

- The Mathematics N5 syllabus has been revised, restructured and updated.
- All of the learning outcomes have been renumbered.
- Some of the learning outcomes have been reworded or broken down into more detail.
- The syllabus now comprises eight modules instead of six. The content of the module 'Application of the definite integral' has been divided up into the following three separate modules:
 - The definite integral
 - Areas and volumes
 - Second moment of area and moment of inertia (second moment of mass).
- Syllabus weightings remain the same.
- The combined weighting of the new Modules 5, 6 and 7 (previously Module 5) is unchanged. These three modules have not been given individual weightings.
- The content of the syllabus has essentially not changed very much. However, many of the learning outcomes have been completely reworded.
- Many of the learning outcomes and didactic guidelines have been simplified or summarised, while a limited amount of new detail has been added to some of the learning outcomes.
- A new learning outcome has been added to Module 5 (Application of the definite integral). Students now also need to be able to determine definite integrals with infinity as a limit.

Changes to examination assessment

Written assessment must include various cognitive skills listed in Bloom's taxonomy. The first table that follows sets out the skills and weighting that applied in the 1996 syllabus.

Old standards (1996)

Recall and reproduction	Understanding and application	Analysis, synthesis and evaluation
±25%	±40%	±35%

The table that follows lists the skills that apply in the 2022 syllabus along with the weighting accorded to each one.

New standards (2022)

Remember	Understand	Apply	Analyse	Evaluate	Create
20	20	20	10	20	10

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Old and new modules and weightings

Old curriculum (1996)

Module 1	Limits and continuity	6%
Module 2	Differentiation	22%
Module 3	Application of differentiation	20%
Module 4	Integration techniques	24%
Module 5	Application of the definite integral	20%
Module 6	Differential equations	8%
Total		100%

New curriculum (2022)

Module 1	Limits and continuity		6%
Module 2	Differentiation		22%
Module 3	Applications of differentiation		20%
Module 4	Integration techniques		24%
Module 5	Application of the definite integral	The definite integral	20%
Module 6		Areas and volumes	
Module 7		Second moment of area and moment of inertia (second moment of mass)	
Module 8	Differential equations		8%
Total			100%

Detailed comparison of changes to the wording of the syllabus

Previous curriculum (1996)	New curriculum (2022)
<p>Module 1: Limits and continuity</p> <p>7.1.1 L'Hospital's rule</p> <p>On completion of this topic, the students should be able to apply L'Hospital's rule if a given quotient is in an indeterminate form of the following types:</p> $\frac{0}{0}; \frac{\infty}{\infty} \quad \infty - \infty$ <p>The student must always indicate the indeterminate form before L'Hospital's rule is applied.</p>	<p>Module 1: Limits and continuity</p> <p>8.1.1 L'Hospital's rule</p> <p>Apply L'Hospital's rule (differentiate the numerator and denominator) to indeterminate functions.</p> <p>L'Hospital's rule are limits that are indeterminate. That is, if</p> $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \begin{cases} \frac{0}{0} \\ \frac{\infty}{\infty} \end{cases} \text{ or } \lim_{x \rightarrow a} f(x) \cdot g(x) = 0 \times \infty$ <p>or</p> $\lim_{x \rightarrow a} [f(x) - g(x)] = \infty - \infty$ <p>Then $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \lim_{x \rightarrow a} \frac{f'(x)}{g'(x)}$</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.1.2 Continuity On completion of this topic, the student should be able to:</p> <p>7.1.2.1 State the conditions for continuity.</p> <p>7.1.2.2 Determine whether a function is continuous or discontinuous in a specified point.</p> <p>DIDACTIC GUIDELINES Examples relating to 7.1.1:</p> <p>a) $\lim_{x \rightarrow 0} \frac{\sin x}{x}$</p> <p>b) $\lim_{x \rightarrow e} \frac{x}{e^x}$</p> <p>c) $\lim_{x \rightarrow 0} \left(\frac{1}{x} - \frac{1}{\sin x} \right)$</p>	<p>8.1.2 Continuity State the conditions for continuity and determine whether a function is continuous or discontinuous in a specific point.</p> <p>A function f is continuous at a number a if $\lim_{x \rightarrow a} f(x) = f(a)$</p>
<p>Module 2: Differentiation</p> <p>7.2.1 Differentiation from first principles On completion of this topic, the student should be able to determine from first principles:</p> <p>7.2.1.1 The derivatives of algebraic functions of the form $f(x) = ax^n$ where $n \in \mathbb{R}$ and $V_{ox} = \pi \int_a^b (x_2^2 - x_1^2) dy$ where a, b, c and d are constants.</p> <p>7.2.1.2 The derivatives of $\sin x$ and $\cos x$</p> <p>7.2.2 Differentiation techniques</p> <p>7.2.2.1 Trigonometric functions On completion of this topic, the student should be able to determine the derivatives of $\tan x$, $\cot x$, $\sec x$ and $\operatorname{cosec} x$ by making use of the derivatives of $\sin x$ and $\cos x$, as well as the rules of differentiation.</p>	<p>Module 2: Differentiation</p> <p>8.2.1 Differentiate from first principles</p> <p>8.2.1.1 Functions of the form $f(x) = ax^n$, $n \neq 1, 2, 3$ using the binomial theorem</p> <p>8.2.1.2 $f(x) = \begin{cases} \sin x, & \frac{dy}{dx} = \cos x \\ \cos x, & \frac{dy}{dx} = -\sin x \end{cases}$</p> <p>8.2.1.3 Fractions of the form $f(x) = \frac{ax + b}{cx + d}$</p> <p>8.2.2 Differentiation techniques</p> <p>8.2.2.1 Trigonometric functions Using the functions $\sin x$ and $\cos x$ along with the rules of differentiation, derive the derivatives of $\tan x$, $\cot x$, $\sec x$ and $\operatorname{cosec} x$.</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.2.2.2 The chain rule On completion of this topic, the student should be able to:</p> <ol style="list-style-type: none"> Apply the chain rule (function of a function) on a number of functions. Determine the derivatives of composite algebraic and trigonometric functions by means of the chain rule, in combination with the quotient and product rule for differentiation by substituting convenient functions. <p>DIDACTIC GUIDELINE Example relating to 7.2.2.2:</p> $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dm} \cdot \frac{dm}{dn} \cdot \frac{dn}{dx}$	<p>8.2.2.2 The chain rule Apply differentiation to the composition of two of more functions by means of the chain rule, in combination with the quotient and product rule, using a convenient substitution.</p>
<p>7.2.2.4 Differentiation of implicit functions On completion of this topic, the student should be able to:</p> <ol style="list-style-type: none"> Differentiate implicit functions. Apply the technique to explicit functions when necessary. <p>DIDACTIC GUIDELINES Examples relating to 7.2.2.4:</p> <ol style="list-style-type: none"> $ax^n + bxy + cy^m = 0$ where $a, b, c, n, m \in \mathbb{R}$. $\sin^2(nx) + bxy - \cos(cy) = 0$ where $n, b, c \in \mathbb{R}$ 	<p>8.2.2.3 Implicit differentiation Here we don't need to solve an equation for y in terms of x in order to find the derivative of y. Instead, we can use the method of implicit differentiation. This consists of differentiating both sides of the equation with respect to x and then solving the resulting equation for $\frac{dy}{dx}$.</p>
<p>7.2.2.3 Logarithmic differentiation On completion of this topic, the student should be able to:</p> <ol style="list-style-type: none"> Use logarithmic laws to rewrite composite functions into a form that is easier to differentiate. Transform a function with a variable in both the radix and the index to a product by taking logarithms on both sides of the equal sign and then differentiating. 	<p>8.2.2.4 Logarithmic differentiation Use logarithmic laws to rewrite composite functions into a form that is easier to differentiate, and transform a function with a variable in both the radix and the index to a product by taking logarithms on both sides of the equal sign and then differentiating.</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>DIDACTIC GUIDELINES Examples relating to 7.2.2.3:</p> <p>a) (i) $\ln [f(x)]^n = n \cdot \ln f(x)$</p> <p>(ii) $\ln \left[\frac{f(x)}{g(x)} \right] = \ln f(x) - \ln g(x)$</p> <p>(iii) $\ln [f(x) \cdot g(x)] = \ln f(x) + \ln g(x)$</p> <p>(iv) $\ln \frac{[f(x)]^a [g(x)]^b}{[h(x)]^c [i(x)]^d}$ $= a \ln f(x) + b \ln g(x) - c \ln h(x) - d \ln i(x)$</p> <p>b) If $y = [f(x)]^{g(x)}$ take logs, and obtain $\ln y = \ln [f(x)]^{g(x)}$ $= g(x) \cdot \ln f(x)$</p> <p>7.2.2.5 Differentiation of inverse trigonometric functions On completion of this topic, the student should be able to:</p> <p>a) Apply the differential coefficients of the six trigonometric functions, to determine the derivatives of:</p> <p>(i) $\arcsin x$ ($\sin^{-1} x$) (ii) $\arccos x$ ($\cos^{-1} x$) (iii) $\arctan x$ ($\tan^{-1} x$) (iv) $\text{arc cot } x$ ($\cot^{-1} x$) (v) $\text{arc sec } x$ ($\sec^{-1} x$) (vi) $\text{arc cosec } x$ ($\text{cosec}^{-1} x$)</p> <p>b) Sketch the graphs of all the inverse trigonometric functions.</p>	<p>8.2.2.4 Inverse trigonometric functions Apply the differential coefficients as well as sketch graphs of the six trigonometric functions to determine the derivatives of:</p> <p>(i) $\arcsin [f(x)]$ (ii) $\arccos [f(x)]$ (iii) $\arctan [f(x)]$ (iv) $\text{arccot } [f(x)]$ (v) $\text{arcsec } [f(x)]$ (vi) $\text{arccosec } [f(x)]$</p>
<p>Module 3: Application of differentiation</p> <p>7.3.1 Newton's/Taylor's method for the approximation of irrational roots of equations On completion of this topic, the student should be able to:</p> <p>7.3.1.1 Determine, with the aid of a table and a neat sketch graph, the approximate value of any root (x_1) of any given function.</p>	<p>Module 3: Applications of differentiation</p> <p>8.3.1 Newton's method Newton/Taylor's method for the approximation of irrational roots of equations</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.3.1.2 Calculate with the aid of the following formulae a better approximation (x_2) of the root:</p> <p>a) $e = -\left[\frac{f(x_1)}{f'(x)}\right]$</p> <p>b) $x_2 = x_1 + e$</p> <p>7.3.1.3 Use the formulae mentioned in 7.3.1.2 to calculate further approximations of the root as specified.</p> <p>7.3.2 Maxima and minima On completion of this topic, the student should be able to apply the differentiation techniques to obtain maximum and minimum values to solve applied optimisation problems.</p> <p>DIDACTIC GUIDELINES The following steps represent a possible procedure for solving problems involving maximum and minimum values as indicated in 7.3.2:</p> <ul style="list-style-type: none"> • Allocate variables to the relevant quantities of the given problem. • Determine (a) formula(e) for the quantity to be maximised or minimised. • Use the conditions stated in the problem to eliminate variables in order to express the quantity to be maximised or minimised as a function of one variable. • Find the interval of possible values for this variable from the physical restrictions in the problem. • Use the techniques of determining maximum and minimum values to determine optimisation. 	<p>8.3.2 Optimisation: Maximum and minimum values Maximum and minimum calculations to solve applied optimisation word problems</p> <p>Steps to follow:</p> <ul style="list-style-type: none"> • Allocate variables to the relevant quantities of the given problem. • Determine a formula for the quantity to be maximised or minimised. • Use conditions stated to eliminate variables in order to express the quantity to be maximised or minimised as a function of one variable. • Find the interval of possible values for this variable from the physical restrictions in the problem.

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Previous curriculum (1996)	New curriculum (2022)
<p>7.3.4 Related rates</p> <p>On completion of this topic, the student should be able to apply differentiation techniques to problems concerned with the rate of change of two related variables with respect to time in which it is not necessary to express either of these variables directly as a function of time.</p> <p>DIDACTIC GUIDELINES</p> <p>Suppose we have an equation involving the variables x and y, and both x and y are function of a third variable t, where t units denote time. Then, because the rate of change of x with respect to t and the rate of change of y with respect to t are given by $\frac{dx}{dt}$ and $\frac{dy}{dt}$, respectively, it can be differentiated on both sides of the given equations with respect to t by applying the chain rule.</p> <p>The following steps represent a possible procedure for solving problem involving related rates.</p> <ul style="list-style-type: none"> • Draw a diagram if it is feasible to do so. • Define the variables. Generally, define t first because the other variables usually depend on t. • Write down any numerical relationships known about the variables and their derivatives with respect to t. • Obtain an equation involving the variables that depend on t. • Differentiate with respect to t on both sides of the equation(s) found in the previous step. • Substitute values of known quantities in the equation of the previous step, and solve the unknown quantity. 	<p>8.3.3 Related rates</p> <p>In a related-rates problem, the idea is to calculate the rate of change of one quantity in terms of the rate of change of another quantity (which may be more easily measured). The procedure is to find an equation that relates the two quantities and then to use the chain rule to differentiate both sides with respect to time.</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.3.3 Rates of change On completion of this topic, the student should be able to apply differentiation techniques to the problems concerned with rates of change.</p> <p>DIDACTIC GUIDELINES Example</p> <p>a) Displacement: $s = f(t)$ where s is the distance covered and t is the time taken to cover that distance, ($t \geq 0$)</p> <p>b) Speed (velocity): $v = \frac{ds}{dt} \quad \left[\frac{\text{change in distance}}{\text{change in time}} \right]$ or $v = f'(t)$</p> <p>c) Acceleration: $a = \frac{dv}{dt}$ or $a = \frac{d^2s}{dt^2}$ or $f''(t)$ [a is obtained through the second derivative of $f(t)$]</p>	<p>8.3.4 Rates of change Whenever the function $y = f(x)$ has a specific interpretation in one of the sciences, its derivative will have a specific interpretation as a rate of change. The units for $\frac{dy}{dx}$ are the units for y divided by the units for x.</p>
<p>Module 4: Integration techniques</p> <p>7.4.1 Integration by inspection On completion of this topic, the student should be able to identify and determine the integrals of the form:</p> <p>a) $\int f'(x) \cdot [f(x)]^n dx$ b) $\int \frac{f'(x)}{f(x)} dx$</p> <p>7.4.2 Integration by means of algebraic substitution On completion of this topic, the student should be able to apply substitution to transform a composite function to a standard form and then integrate.</p>	<p>Module 4: Integration techniques</p> <p>8.4.1 Basic integration Revision of N4 integration $\int f(x) dx = F(x) + c$</p> <p>8.4.2 Integration by inspection Integration of functions that contain their respective derivatives under the integrand</p> <p>8.4.3 Integration by means of algebraic substitution The idea behind the substitution rule is to replace a relatively complicated integral by a simpler integral. This is accomplished by changing from the original variable x to a new variable u that is a function of x.</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.4.6 Integration of trigonometric functions On completion of this topic, the student should be able to integrate the following functions:</p> <p>7.4.6.1 $\int f'(x) \cdot \sin f(x) dx$ (The same for the other trigonometric functions)</p> <p>7.4.6.2 $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$ and $\int \cot^n x dx$ where $n = 1, 2, 3$</p> <p>7.4.6.3 $\int \sin^m x \cos^n x dx$ where m and n are positive, m and/or n are odd and m and $n \leq 3$</p> <p>7.4.6.4 $\int \sin(ax) dx$, $\int \cos(ax) dx$, $\int \tan(ax) dx$ and $\int \cot(ax) dx$</p> <p>7.4.6.5 $\int \sin^2(ax) dx$, $\int \cos^2(ax) dx$, $\int \tan^2(ax) dx$ and $\int \cot^2(ax) dx$ by using the following identities: (i) $\sin^2 x = \frac{1}{2}(1 - \cos^2 x)$ (ii) $\cos^2 x = \frac{1}{2}(1 + \cos^2 x)$ (iii) $\cot^2 x = \operatorname{cosec}^2 x - 1$ (iv) $\tan^2 x = \sec^2 x - 1$</p>	<p>8.4.4 Integration of trigonometric functions</p> <p>In general, we try to write an integrand involving powers of sine and cosine in a form where we have only one sine factor (and the remainder of the expression in terms of cosine) or only one cosine factor (and the remainder of the expression in terms of sine). The identity $\sin^2 x + \cos^2 x = 1$ enables us to convert back and forth between even powers of sine and cosine.</p> <p>a) Square identities Examples: $\int \sin^2 x dx$, $\int \cos^2 x dx$, $\int \tan^2 x dx$, $\int \cot^2 x dx$ For $\sin^2 x$ and $\cos^2 x$, we use the half-angle identities $\sin^2 ax = \frac{1}{2}(1 - \cos 2ax)$ $\cos^2 ax = \frac{1}{2}(1 + \cos 2ax)$ For $\tan^2 x$ and $\cot^2 x$, we use the identities $\tan^2 x = \sec^2 x - 1$ and $\cot^2 x = \operatorname{cosec}^2 x - 1$ respectively.</p> <p>b) Different exponents Examples: $\int \sin^m x \cos^n x dx$; $m \leq 5$ and m, n odd</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.4.6.6 $\int \sin(ax) \cdot \cos(bx) dx$, $\int \sin(ax) \cdot \sin(bx) dx$ and $\int \cos(ax) \cdot \cos(bx) dx$ by transforming:</p> <p>(i) $\sin A \cos B = \frac{1}{2}[\sin(A+B) + \sin(A-B)]$ (ii) $\cos A \sin B = \frac{1}{2}[\sin(A+B) - \sin(A-B)]$ (iii) $\cos A \cos B = \frac{1}{2}[\cos(A+B) + \cos(A-B)]$ (iv) $\sin A \sin B = \frac{1}{2}[\cos(A-B) - \cos(A+B)]$</p>	<p>c) Different coefficients Examples: To evaluate the following integrals $\int \sin ax \sin bx dx$; $a, b \leq 3$ $\int \sin ax \cos bx dx$; $a, b \leq 3$ $\int \cos ax \sin bx dx$; $a, b \leq 3$ $\int \cos ax \cos bx dx$; $a, b \leq 3$ we use the identities $\sin A \sin B = \frac{1}{2}[\cos(A-B) - \cos(A+B)]$ $\sin A \cos B = \frac{1}{2}[\sin(A+B) + \sin(A-B)]$ $\cos A \sin B = \frac{1}{2}[\sin(A+B) - \sin(A-B)]$ $\cos A \cos B = \frac{1}{2}[\cos(A+B) + \cos(A-B)]$</p>
<p>7.6.4.7 (i) If given $bx = a \sin \theta$, then: $\int \frac{dx}{\sqrt{a^2 - b^2 x^2}} = \frac{1}{b} \sin^{-1}\left(\frac{bx}{a}\right) + c$ (ii) If given $bx = a \tan \theta$, then: $\int \frac{dx}{b^2 x^2 + a^2} = \frac{1}{ab} \tan^{-1}\left(\frac{bx}{a}\right) + c$ (iii) If given $bx = a \sin \theta$, then: $\int \sqrt{a^2 - b^2 x^2} dx = \frac{a^2}{2b} \sin^{-1}\left(\frac{bx}{a}\right) + \frac{x}{2} \sqrt{a^2 - b^2 x^2} + c$</p>	<p>d) Trigonometric substitutions Examples: $\int \frac{1}{\sqrt{a^2 - b^2 x^2}} dx = \frac{1}{a} \arcsin\left(\frac{bx}{a}\right) + c$ $\int \frac{1}{a^2 + b^2 x^2} dx = \frac{1}{ab} \arctan\left(\frac{bx}{a}\right) + c$ $\int \sqrt{a^2 - b^2 x^2} dx = \frac{a^2}{2b} \arcsin\left(\frac{bx}{a}\right) + \frac{x}{2} \sqrt{a^2 - b^2 x^2} + c$</p>
<p>7.4.3 Integration by algebraic fractions On completion of this topic, the student should be able to:</p>	<p>8.4.5 Integration of algebraic fractions</p>
<p>7.4.3.1 Rewrite fractions into standard forms using suitable constants.</p> <p>DIDACTIC GUIDELINE Example relating to 7.4.3.1: $\int \frac{dx}{ax+b} = \frac{1}{a} \int \frac{a dx}{ax+b} = \frac{1}{a} \ln(ax+b) + c$</p>	
<p>7.4.3.2 Transform fractions where the numerator is of a higher order than the denominator, by means of long division, into a standard form that can be integrated.</p>	<p>When the highest degree of the numerator is greater than or equal to the highest degree of the denominator, we first perform long division.</p>

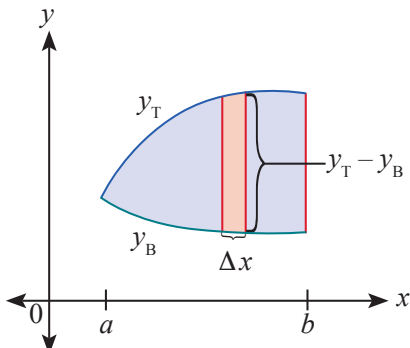
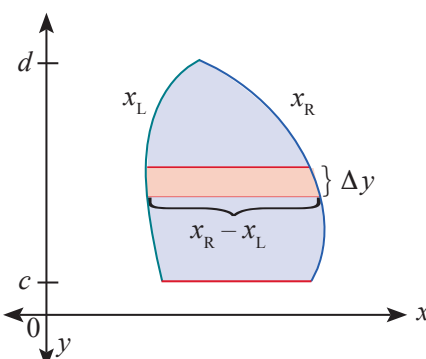
Mathematics N5

Previous curriculum (1996)	New curriculum (2022)
<p>7.4.4 Partial fractions On completion of this topic, the student should be able to integrate by dividing the integrand into partial fractions if the integrand is in the form:</p> $\frac{f(x)}{g(x)}$ <p>where $f(x)$ and $g(x)$ are both polynomials and $f(x)$ is of a lower order than $g(x)$ and $g(x)$ can be factorised. The following forms will be examined:</p> <p>a) $\int \frac{f(x) dx}{(ax + b)(cx + d)}$</p> <p>b) $\int \frac{f(x) dx}{(ax + b)^2}$</p>	<p>8.4.6 Partial fractions If the degree of the numerator is less than the degree of the denominator, we do not need to divide. In this case, we use partial fractions. Examples:</p> <p>a) Denominator has two distinct factors For integrals of the form $\int \frac{f(x)}{(ax \pm b)(cx \pm d)} dx$ we use the partial fraction expansion to evaluate the integral $\frac{f(x)}{(ax \pm b)(cx \pm d)} = \frac{A}{(ax \pm b)} + \frac{B}{(cx \pm d)}$</p> <p>b) Denominator has two or three recursive factors For integrals of the form $\int \frac{f(x)}{(ax \pm b)^3} dx$ we use the partial fraction expansion to evaluate the integral $\frac{f(x)}{(ax \pm b)^3} = \frac{A}{(ax \pm b)^3} + \frac{B}{(ax \pm b)^2} + \frac{C}{ax \pm b}$</p>
<p>7.4.5 Integration by parts On completion of this topic, the students should be able to integrate a product of two functions, where the one function is not the derivative of the other function, by using the formula $\int f(x) g'(x) dx = f(x) g(x) - \int f'(x) g(x) dx$ The derivative of simple products will be examined.</p>	
<p>Module 5: Application of the definite integral</p> <p>7.5.1 Solving the definite integral On completion of this topic, the student should be able to evaluate the following definite integrals:</p> <p>a) $\int_a^b f(x) dx = [F(x)]_a^b = F(b) - F(a)$</p>	<p>Module 5: The definite integral</p> <p>8.5.1 Definite integrals Calculate basic definite integrals. $\int_a^b f(x) dx = f(b) - f(a)$</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>b) $\int_{x_1}^{x_2} f(x) dx = \int_{u_1}^{u_2} g(u) du$</p> <p>c) $\int_0^\infty e^{-st} \cdot f(t) dt$ where (i) $f(t) = A$ (A is a constant) (ii) $f(t) = t$ DIDACTIC GUIDELINE NB: 7.5.1 (c) is an introduction to Laplace transformations.</p>	<p>8.5.2 Change of limits Calculate a definite integral using change of limits. In this method, which is usually preferable, the limits of integration are changed when the variable is changed.</p> <p>8.5.3 Infinity as a limit Determine definite integrals with infinity as a limit. When the integral is bounded above or below by infinity, we change limits to introduce a new limit for the upper or lower bound of the integral. $\int_a^\infty f(x) dx = \lim_{b \rightarrow \infty} \int_a^b f(x) dx \text{ and } \int_{-\infty}^a f(x) dx = \lim_{b \rightarrow -\infty} \int_b^a f(x) dx$</p> <p>8.5.4 Laplace transformation Apply the definite integral to the Laplace transformation. $L[f(t)] = \int_0^\infty e^{-st} f(t) dt$ $f(t) = \begin{cases} A, & L[A] = \frac{A}{s}, \text{ for some constant } A \\ t, & L[t] = \frac{1}{s^2} \end{cases}$</p>
<p>Module 5: Application of the definite integral (continued) DIDACTIC GUIDELINES SECTIONS 7.5.2–7.5.5 MUST BE DONE AS FOLLOWS:</p> <ol style="list-style-type: none"> 1. Give a rough sketch of the relevant curves. 2. Indicate the relevant limits and points of intersection on the graph after the necessary calculations have been done. 3. Indicate the representative strip and the relevant distance to the reference axis when working with moments. 4. Give the ΔA, ΔV, ΔI, etc. As required. 	<p>Module 6: Areas and volumes</p> <ul style="list-style-type: none"> • Sketch a function on a given interval. • Sketch the curves after calculating all the relevant points of intersection and x- and y-intercepts. • Indicate the relevant limits and representative strip used to calculate the area or volume.

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Previous curriculum (1996)	New curriculum (2022)
<p>5. Use the definite integral to find the total area, volume, etc.</p> <p>7.5.2 Areas On completion of this topic, the student should be able to:</p> <p>7.5.2.1 Calculate the area between a curve and one of the reference axes. a) $A_{ox} = \int_a^b y \, dx$ b) $A_{oy} = \int_a^b x \, dy$</p> <p>7.5.2.2 Calculate the area between two curves.</p>	<ul style="list-style-type: none"> Calculate the areas and volumes of a given function or two functions using a definite integral. <p>8.6.1 Areas</p> <p>8.6.1.1 Calculate the area between a curve and one of the reference axes using $A_x = \int_a^b y \, dx$ where $a \leq x \leq b$ $A_y = \int_c^d x \, dy$ where $c \leq y \leq d$</p> <p>8.6.1.2 Calculate the area between two curves using $A_x = \int_a^b (y_T - y_B) \, dx$ where a and b are the x-coordinates of the intersections between the two curves</p>  $A_y = \int_c^d (x_R - x_L) \, dy$ <p>where c and d are the y-coordinates of the intersections between the two curves</p> 

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Previous curriculum (1996)	New curriculum (2022)
<p>7.5.3 Volumes of solids of revolution On completion of this topic, the student should be able to calculate the volume of a solid of revolution that is generated when:</p> <p>7.5.3.1 An area between a curve and a reference axis is rotated about the same axis. a) $V_{ox} = \pi \int_a^b y^2 dx$ b) $V_{oy} = \pi \int_a^b x^2 dy$</p> <p>7.5.3.2 An area between two curves is rotated about a reference axis (with the specific application of the representative strip taken perpendicular to the reference axis). c) $V_{ox} = \pi \int_a^b (y_2^2 - y_1^2) dx$ d) $V_{oy} = \pi \int_a^b (x_2^2 - x_1^2) dy$</p>	<p>8.6.2 Volumes</p> <p>8.6.2.1 Calculate the volume (disc method only) between a curve and one of the reference axes $V_x = \pi \int_a^b y^2 dx$ where $a \leq x \leq b$ $V_y = \pi \int_c^d x^2 dy$ where $c \leq y \leq d$</p> <p>8.6.2.2 Calculate the volume between two curves $V_x = \pi \int_a^b (y_B^2 - y_T^2) dx$ where a and b are the x-coordinates of the intersections between the two curves $V_y = \pi \int_c^d (x_R^2 - x_L^2) dy$ where c and d are the y-coordinates of the intersections between the two curves.</p>
<p>Module 5: Application of the definite integral (continued)</p> <p>DIDACTIC GUIDELINES</p> <p>SECTIONS 7.5.2–7.5.5 MUST BE DONE AS FOLLOWS:</p> <p>3. Indicate the representative strip and the relevant distance to the reference axis when working with moments.</p> <p>7.5.4 Second moment of area On completion of this topic, the student should be able to calculate the second moment of area of the following:</p>	<p>Module 7: Second moment of area and moment of inertia</p> <ul style="list-style-type: none"> Sketch a rectangular or circular lamina with respect to an axis on a given interval. Calculate second moment of area with respect to a rectangular or circular lamina. Calculate the moment of inertia (second moment of mass) with respect to a rectangular or circular lamina. <p>8.7.1 Second moment of area</p>

Mathematics N5

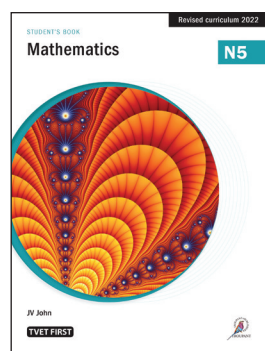
Previous curriculum (1996)	New curriculum (2022)
<p>7.5.4.1 A rectangular lamina with respect to a reference axis in the plan of the lamina and parallel to one side of the lamina (the axis may be through the centroid, one of the sides of the lamina or outside of the lamina).</p> <p>7.5.4.2 A circular lamina with respect to a reference axis perpendicular to the plan of the lamina and through the centre of the lamina.</p> <p>7.5.5 Moment of inertia (second moment of mass) On completion of this topic, the student should be able to determine the moment of inertia of:</p> <p>7.5.5.1 A uniform circular disc with mass (m) with respect to a reference axis through the centre of the disc and perpendicular to the plane of the disc.</p> <p>7.5.5.2 A uniform rectangular prism with mass (m) with respect to a reference axis parallel to one side of the prism (the axis may be through the centroid, one of the sides of the prism or outside of the prism).</p>	<p>8.7.1.1 Determine the second moment of area with respect to a rectangular lamina with respect to a reference axis in the plane of the lamina and parallel to one side of the lamina (the axis may be through the centroid, one of the sides of the lamina or outside of the lamina).</p> <p>8.7.1.2 Determine the second moment of area with respect to a uniform circular disc with respect to a reference axis through the centre of the disc and perpendicular to the plane of the disc.</p> <p>8.7.2 Moment of inertia (second moment of mass)</p> <p>8.7.2.2 Determine the moment of inertia (second moment of mass) of a uniform circular disc with respect to a reference axis through the centre of the disc and perpendicular to the plane of the disc.</p> <p>8.7.2.1 Determine the moment of inertia (second moment of mass) of a rectangular lamina with respect to a reference axis in the plane of the lamina and parallel to one side of the lamina (the axis may be through the centroid, one of the sides of the lamina or outside of the lamina).</p>
<p>Module 6: Differential equations On completion of this topic, the student should be able to:</p> <p>7.6.1 Distinguish between the particular and general solutions of differential equations and determine particular solutions from general solutions when the necessary information is given.</p>	<p>Module 8: Differential equations</p>

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Previous curriculum (1996)	New curriculum (2022)
<p>7.6.2 Solve first order differential equations:</p> <p>7.6.2.1 By direct integration</p> <p>7.6.2.2 By separating the variables to the form $f(x)dx = f(y)dy$ and then integrating</p> <p>7.6.3 Solve second order differential equations of the form $\frac{d^2y}{dx^2} = ax^2 + bx + c$</p>	<p>8.8.1 First order differential equation Determine the general and particular solutions of a first order differential equation by applying</p> <p>(i) Integration</p> <p>(ii) Separation of variables</p> <p>8.8.2 Second order differential equation Determine particular solutions from general solutions of a second order differential equation using specific conditions.</p>

Mathematics N4–N6: Pick the course that works best for you

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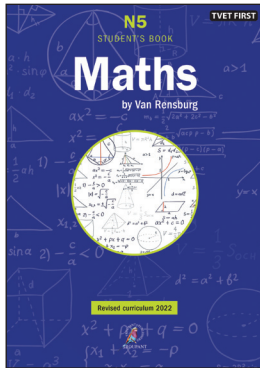


Mathematics (SA Chuturgoon and JV John)

This full-colour Student's Book is a complete course between two covers, offering extensive explanations of all the required content. It is full of real-world engineering applications so students gain a clear grasp of the mathematical theory, as well as a solid grounding in how to apply it in an engineering context. It provides a range of study aids, from mnemonics to help students memorise important information to graded worked examples that cater to a wide spectrum of students.

Mathematics is ideal for the following:

- All students enrolled for Mathematics N4, N5 and N6.
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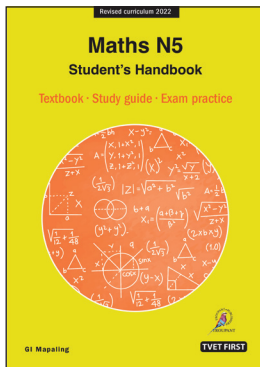
Maths by Van Rensburg (MJJ van Rensburg)

This tried and trusted series has been thoroughly revised and updated to cover the latest curriculum requirements. Clear and concise, the book is an effective and proven learning tool that offers to-the-point explanations, varied activities covering the full range of examination requirements and extension activities for students seeking enrichment. The series teaches students to apply their knowledge, not simply memorise it.

- While all necessary formulae are covered, this series is focused on understanding and application.
- The series was written by a subject expert with 35 years of lecturing experience.
- The Lecturer's Guide includes complete solutions to all the activities.

Maths by Van Rensburg is ideal for the following:

- Students who want to consolidate their knowledge of the basics of mathematics quickly and easily.
- Stronger students looking for extension and enrichment activities.
- Lecturers who like to work with alternative methods to cater for different learning styles.
- Lecturers who have enjoyed a previous edition of *Maths by Van Rensburg* and know that it works for them.



Maths Student's Handbook (GI Mapaling)

Get straight to the point with a practical, hands-on approach. This essential series provides a targeted approach to understanding mathematics problems with step-by-step explanations and guidance in applying knowledge. Students can gain vital insights into where they make mistakes by checking their work using the full solutions at the back of each book.

The books aim to help students to do the following:

- Analyse the question.
- Select the method and tools needed to solve the question.
- Apply the method.

The Maths Student's Handbook is ideal for the following:

- Students who are studying mostly on their own and need everything in one comprehensive, hands-on guide.
- Students who are using another core textbook, but need more practical application and help with their technique.
- Students who want a significant improvement in their results, whether from a 'fail' to a 'pass' or from 'very good' to 'excellent'.
- Lecturers who want to help students take responsibility for their learning.

Strength of Materials and Structures N5

Overview of main curriculum changes

- The syllabus for Strengths of Materials and Structures N5 has been fully reworked and updated.
- It has been restructured and reordered, and is now broken into eight weighted modules with learning content and detailed learning outcomes.
- Both the learning content and the learning outcomes have been completely reworded, and much more detail has been provided for all sections.
- The old Modules 1 and 2 have been combined into one module (Module 1: Stress, strain and tensile testing of materials).
- Loading of beams and bending of beams have been combined into one module (Module 5: Simple bending of beams).
- Module 11 (Testing machines, apparatus and methods) and Module 12 (The mixing and placing of concrete for general purpose) from the old syllabus have been completely removed.
- The aim of the new syllabus is for students to understand each basic scientific principle that it covers in a way that will allow them to integrate and use this knowledge in their applied trade theory subjects.

Structure and weighting changes

Previous syllabus (1981)

Old curriculum modules (No weighting given)	
1.	Forces
2.	Stress, strain and factor of safety
3.	Simple framed structures
4.	Thin cylinders and riveted joints
5.	Shafts
6.	Strain energy
7.	Loading of beams
8.	Bending of beams
9.	Long columns and struts
10.	Simple cases of temperature stress and compound bars
11.	Testing machines, apparatus and methods
12.	The mixing and placing of concrete for general purposes

Strength of Materials and Structures N5

New syllabus (2022)

New curriculum modules	Weighting
1. Stress, strain and tensile testing of materials	8
2. Strain energy	8
3. Temperature-induced stresses	14
4. Thin cylinders and Mohr's circle	14
5. Simple bending of beams	14
6. Columns and struts	14
7. Twisting of circular shafts	14
8. Structural frameworks	14
Total	100

Detailed curriculum changes

Previous curriculum (1981)	New curriculum (2022)
<p>Module 1: Forces</p> <ul style="list-style-type: none"> Resultant and equilibrant of co-planer forces Graphical and analytical solutions for three or more forces <p>Module 2: Stress, strain and factor of safety</p> <ul style="list-style-type: none"> Tensile, compressive and shear stress and strain Hooke's law Modulus of elasticity Factor of safety 	<p>Module 1: Stress, strain and tensile testing of materials</p> <p>On completion of this module, the student should be familiar with solving problems related to stress and strain and tensile testing.</p> <p>1.1 Stress, strain and tensile testing of materials</p> <ul style="list-style-type: none"> Name the three different types of stresses. Calculate direct and shear stresses. Know what strain is and how to calculate it. Know what modulus of elasticity is and how to calculate it. Calculate the change in the length, final length and percentage change in the length of a bar. Draw a stress/strain graph and use it to obtain information about a material. Draw a force/extension graph or a stress/strain graph and use it to calculate Young's modulus for a material.

Strength of Materials and Structures N5

Previous curriculum (1981)	New curriculum (2022)
	<p>1.2 Compound bars</p> <ul style="list-style-type: none"> • Calculate stresses for different materials connected in parallel, including a pipe with a threaded bar and nut. • Calculate stresses when different materials are connected in series. • Calculate the change in the length of each material. • Calculate the final length of a compound bar.
<p>Module 6: Strain energy</p> <ul style="list-style-type: none"> • Strain energy due to tension and compression • Resilience • Stresses due to suddenly applied loads and falling loads 	<p>Module 2: Strain energy</p> <p>On completion of this module, the student should be able to calculate stresses in single and compound members due to three ways in which loads can be applied.</p> <p>2.1 Strain energy</p> <ul style="list-style-type: none"> • Explain what strain energy is and how to calculate it. • Express strain energy in terms of force and stress. <p>2.2 Gradually applied load</p> <ul style="list-style-type: none"> • Explain what gradually applied load is. • Calculate strain energy when a load is applied gradually (single and compound bars). <p>2.3 Suddenly applied load</p> <ul style="list-style-type: none"> • Explain what suddenly applied load is. • Calculate strain energy when a sudden load is applied (single and compound bars). <p>2.4 Shock load</p> <ul style="list-style-type: none"> • Explain what shock load is. • Calculate strain energy when shock load is applied (single and compound bars).

Strength of Materials and Structures N5

Previous curriculum (1981)	New curriculum (2022)
	<ul style="list-style-type: none"> Calculate the height a load may fall in order not to exceed the stress limit.
Module 10: Simple cases of temperature stress and compound bars	<p>Module 3: Compound bars and temperature-induced stresses</p> <p>On completion of this module, the student should be able to calculate resultant stresses in compound bars subjected to changes in temperature and external forces.</p> <p>3.1 Temperature-induced stresses</p> <ul style="list-style-type: none"> Calculate change in length due to temperature for different materials (free expansion or contraction). Calculate stresses due to temperature rise or cooling for different materials connected in series and then prevented from expanding or contracting. Calculate stresses due to temperature rise or cooling for different materials connected in parallel, including a pipe with a threaded bar and nut. Calculate the final length of a compound bar. <p>3.2 Resultant stresses</p> <ul style="list-style-type: none"> Calculate resultant stresses due to temperature and external forces when materials are connected in parallel or series. Calculate the resultant change in length of a compound bar. Calculate the final length of a compound bar.

Strength of Materials and Structures N5

Previous curriculum (1981)	New curriculum (2022)
Module 4: Thin cylinders and riveted joints <ul style="list-style-type: none"> Stresses in thin cylinders subjected to internal pressure Single and double riveted lap and butt joints Efficiency of joints 	Module 4: Thin cylinders and Mohr's circle <p>On completion of this module, the student should be able to calculate tensile and longitudinal stresses in thin cylinders. The student should also be introduced to Mohr's circle for direct stresses only.</p> <p>4.1 Stresses in thin cylinders</p> <ul style="list-style-type: none"> Calculate the circumferential stress in a thin cylinder when it is subjected to internal pressure. Calculate the longitudinal stress in a cylinder when it is subjected to internal pressure. Calculate the theoretical thickness or diameter of a cylinder when longitudinal and circumferential efficiency is involved. <p>4.2 Strain in thin cylinders</p> <ul style="list-style-type: none"> Calculate the longitudinal strain in a thin cylinder when it is subjected to internal pressure. Calculate the circumferential strain in a thin cylinder when it is subjected to internal pressure. Calculate the volumetric strain in a thin cylinder when it is subjected to internal pressure. <p>4.3 Mohr's stress circle</p> <ul style="list-style-type: none"> Construct Mohr's stress circle when given stresses in the x and y planes in order to determine the stresses in a different plane.
Module 7: Loading of beams <ul style="list-style-type: none"> Shear force and bending moment diagrams for simply supported and cantilever beams under concentrated and/or uniformly distributed loads 	Module 5: Simple bending of beams <p>On completion of this module, the student should be able to do calculations on standard beams and built-up beams.</p>

Strength of Materials and Structures N5

Previous curriculum (1981)	New curriculum (2022)
<ul style="list-style-type: none"> Determination of maximum bending moment and bending moment at any point on the beam 	
Module 8: Bending of beams <ul style="list-style-type: none"> Section modulus Properties of sections Moments of inertia of rectangular, box, circular, channel, I- and T-sections and simple built-up sections 	<p>5.1 The theory of simple bending</p> <ul style="list-style-type: none"> Understand and use the simple bending equation. Understand bending moment formulae for standard beams. Calculate the maximum moment of resistance for simply supported beams and cantilevers supporting a maximum of one UDL and one point load only. Calculate the position and value of the maximum bending moment for a simply supported beam supporting UDL over its full length plus an eccentric point load. Calculate the centroid position (neutral axis) for standard and built-up beams under pure bending. Calculate the second moment of area about both axes for standard and built-up beams. Calculate the maximum and minimum stresses for built-up beams. Sketch a stress distribution diagram to indicate the position of the neutral axis. <p>5.2 Hot rolled structural steel sections</p> <ul style="list-style-type: none"> Select information for standard steel sections from section tables. Select suitable standard profiles from section tables using section modulus with bending stress limit given. Calculate the maximum and minimum stresses in standard profiles from section tables.

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Previous curriculum (1981)	New curriculum (2022)
	<ul style="list-style-type: none"> • Calculate the centroid position (neutral axis) for standard and built-up beams under pure bending. • Calculate the second moment of area about both axes for standard and built-up beams. • Calculate the maximum and minimum stresses for built-up beams. • Sketch a stress distribution diagram to indicate the position of the neutral axis.
Module 9: Long columns and struts <ul style="list-style-type: none"> • Euler and Rankine formulae (central loading only) • Empirical straight line formula 	Module 6: Columns and struts On completion of this module, the student should be able to do calculations on buckling loads using Euler's theory and Rankine's theory. <p>6.1 Introduction to columns and struts</p> <ul style="list-style-type: none"> • Differentiate between columns and struts. • Define effective length. <p>6.2 Fixing of ends and calculations on struts and columns</p> <ul style="list-style-type: none"> • Calculate the effective length for both ends pinned, both ends fixed, one end pinned and one end fixed as well as one end fixed and the other end free. • Calculate the slenderness ratio of a strut or column. • Calculate buckling loads using Euler's theory as well as Rankine's theory.
Module 5: Shafts <ul style="list-style-type: none"> • Stress due to torsion • Angle of twist • Diameters and power for solid and hollow shafting 	Module 7: Shafts On completion of this module, the student should be able to recognise the two limits of shafts transmitting power and torque. The student should also be able to calculate the safe shear stress and twisting angle for a shaft.

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Previous curriculum (1981)	New curriculum (2022)
	<p>7.1 Introduction to limits in shaft design</p> <ul style="list-style-type: none"> Understand the two critical limits that must be considered when designing shafts: shear stress limit and twisting angle limit. <p>7.2 Calculations on circular shafts</p> <ul style="list-style-type: none"> Apply the torque equation and the power equation. Calculate maximum torque when starting torque is not considered. Calculate maximum torque when starting torque is considered as a percentage of the average torque. Calculate the dimensions of a solid shaft as well as a hollow shaft when a stress limit or twisting angle limit is given. Calculate the percentage saving in weight if a solid shaft is replaced by a hollow shaft for the same shear stress limit. Do calculations on compound shafts connected in series and in parallel.
<p>Module 3: Simple framed structures</p> <ul style="list-style-type: none"> Determination of stress in members (graphical solutions only) 	<p>Module 8: Structural framework</p> <p>On completion of this module, the student should be able to calculate reaction in supports of framework. The student should also be able to determine the forces in members of a framework by means of a graph.</p> <p>8.1 Introduction to structural frameworks</p> <ul style="list-style-type: none"> Understand rules for statically determinate plane framework. Differentiate between a tie and strut. Apply mathematical triangles.

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Previous curriculum (1981)	New curriculum (2022)
	<p>8.2 Calculations on structural frameworks</p> <ul style="list-style-type: none"> • Apply the equilibrium law. • Calculate reactions at the supports of structural frameworks with vertical loads. • Calculate reactions at the supports of structural frameworks with vertical as well as horizontal loads or angled loads with one of the supports on rollers. • Draw a space diagram of the framework to scale. • Draw a vector diagram of the framework to scale and graphically determine the forces in simply supported structural frameworks or cantilevers. • Identify if a member is a strut or a tie.
<p>Module 11: Testing machines, apparatus and methods (Not in new syllabus)</p> <ul style="list-style-type: none"> • Tension, compression and shearing tests • Brinell and Rockwell hardness tests • Izod impact test • Fatigue testing • Creep • Effect of high temperatures • Corrosion <p>Module 12: The mixing and placing of concrete for general purposes (Not in new syllabus)</p> <ul style="list-style-type: none"> • A general knowledge of the purpose and placing of steel reinforcements in concrete beams, slabs and columns • Types of foundations and their applications (no calculations) 	

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***TVET First* authors**

VH Dookhi & A Knott

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