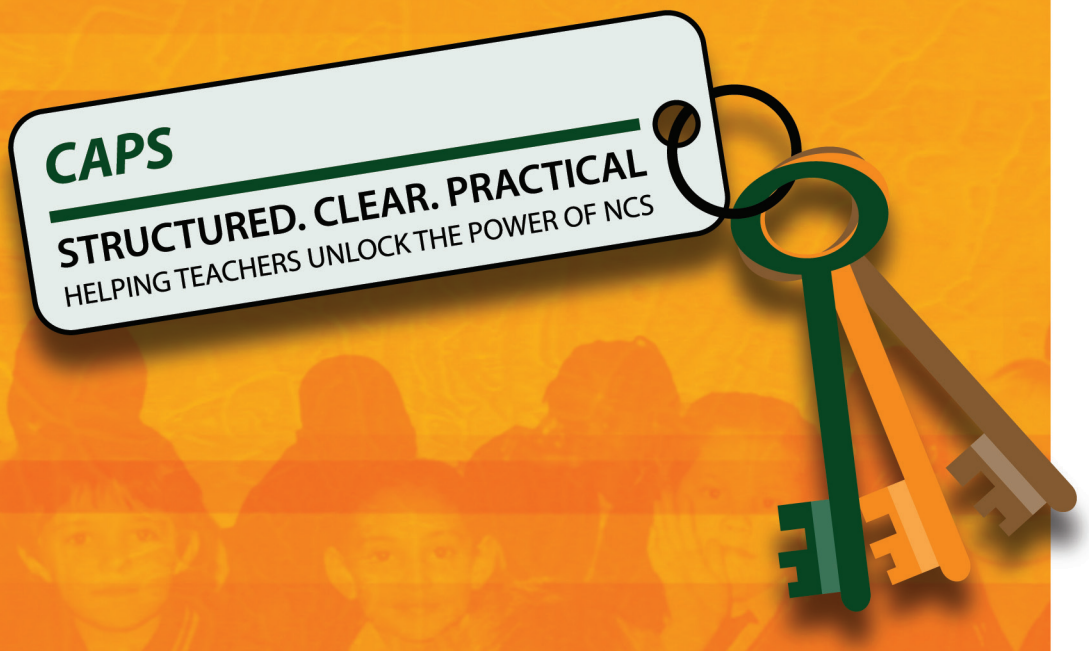
COMPUTER APPLICATIONS TECHNOLOGY

National Curriculum Statement (NCS)

Curriculum and Assessment Policy Statement



Further Education and Training Phase Grades 10-12

basic education
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CURRICULUM AND ASSESSMENT POLICY STATEMENT
GRADES 10-12

COMPUTER APPLICATIONS TECHNOLOGY

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FOREWORD BY THE MINISTER

Our national curriculum is the culmination of our efforts over a period of seventeen years to transform the curriculum bequeathed to us by apartheid. From the start of democracy we have built our curriculum on the values that inspired our Constitution (Act 108 of 1996). The Preamble to the Constitution states that the aims of the Constitution are to:

- heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;
- improve the quality of life of all citizens and free the potential of each person;
- lay the foundations for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and
- build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations.

Education and the curriculum have an important role to play in realising these aims.

In 1997 we introduced outcomes-based education to overcome the curricular divisions of the past, but the experience of implementation prompted a review in 2000. This led to the first curriculum revision: the *Revised National Curriculum Statement Grades R-9* and the *National Curriculum Statement Grades 10-12* (2002).

Ongoing implementation challenges resulted in another review in 2009 and we revised the *Revised National Curriculum Statement* (2002) to produce this document.

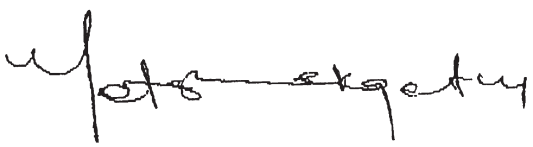
From 2012 the two 2002 curricula, for *Grades R-9* and *Grades 10-12* respectively, are combined in a single document and will simply be known as the *National Curriculum Statement Grades R-12.* The *National Curriculum Statement for Grades R-12* builds on the previous curriculum but also updates it and aims to provide clearer specification of what is to be taught and learnt on a term-by-term basis.

The *National Curriculum Statement Grades R-12* accordingly replaces the Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines with the

(a) Curriculum and Assessment Policy Statements (CAPS) for all approved subjects listed in this document;

(b) *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*; and

(c) *National Protocol for Assessment Grades R-12.*



MRS ANGIE MOTSHEKGA, MP
MINISTER OF BASIC EDUCATION

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SECTION 1

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENTS FOR COMPUTER APPLICATIONS TECHNOLOGY GRADES 10-12

1.1 Background

The *National Curriculum Statement Grades R-12 (NCS)* stipulates policy on curriculum and assessment in the schooling sector.

To improve implementation, the National Curriculum Statement was amended, with the amendments coming into effect in January 2012. A single comprehensive Curriculum and Assessment Policy document was developed for each subject to replace Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines in Grades R-12.

1.2 Overview

(a) The *National Curriculum Statement Grades R-12 (January 2012)* represents a policy statement for learning and teaching in South African schools and comprises the following:

(i) Curriculum and Assessment Policy Statements for each approved school subject;

(ii) The policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(iii) The policy document, National Protocol for Assessment Grades R-12 (January 2012).

(b) The *National Curriculum Statement Grades R-12 (January 2012)* replaces the two current national curricula statements, namely the

(i) Revised National Curriculum Statement Grades R-9, Government Gazette No. 23406 of 31 May 2002, and

(ii) National Curriculum Statement Grades 10-12 Government Gazettes, No. 25545 of 6 October 2003 and No. 27594 of 17 May 2005.

(c) The national curriculum statements contemplated in subparagraphs b(i) and (ii) comprise the following policy documents which will be incrementally repealed by the *National Curriculum Statement Grades R-12 (January 2012)* during the period 2012-2014:

(i) The Learning Area/Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines for Grades R-9 and Grades 10-12;

(ii) The policy document, National Policy on assessment and qualifications for schools in the General Education and Training Band d, promulgated in Government Notice No. 124 in Government Gazette No. 29626 of 12 February 2007;

(iii) The policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), promulgated in Government Gazette No.27819 of 20 July 2005;

(iv) The policy document, An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding learners with special needs, published in Government Gazette, No.29466 of 11 December 2006, is incorporated in the policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(v) The policy document, An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R-12), promulgated in Government Notice No.1267 in Government Gazette No. 29467 of 11 December 2006.

(d) The policy document, *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*, and the sections on the Curriculum and Assessment Policy as contemplated in Chapters 2, 3 and 4 of this document constitute the norms and standards of the *National Curriculum Statement Grades R-12.* It will therefore, in terms of *section 6A* of the *South African Schools Act, 1996 (Act No. 84 of 1996,)* form the basis for the Minister of Basic Education to determine minimum outcomes and standards, as well as the processes and procedures for the assessment of learner achievement to be applicable to public and independent schools.

1.3 General aims of the South African Curriculum

(a) The *National Curriculum Statement Grades R-12* gives expression to the knowledge, skills and values worth learning in South African schools. This curriculum aims to ensure that children acquire and apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives.

(b) The National Curriculum Statement Grades R-12 serves the purposes of:

- equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
- providing access to higher education;
- facilitating the transition of learners from education institutions to the workplace; and
- providing employers with a sufficient profile of a learner's competences.

(c) The National Curriculum Statement Grades R-12 is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;

- Progression: content and context of each grade shows progression from simple to complex;
- Human rights, inclusivity, environmental and social justice: infusing the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa. The National Curriculum Statement Grades R-12 is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(d) The National Curriculum Statement Grades R-12 aims to produce learners that are able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively as individuals and with others as members of a team;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

(e) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity.

The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, Institutional-Level Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's *Guidelines for Inclusive Teaching and Learning* (2010).

1.4 Time Allocation

1.4.1 Foundation Phase

(a) The instructional time in the Foundation Phase is as follows:

SUBJECT	GRADE R (HOURS)	GRADES 1-2 (HOURS)	GRADE 3 (HOURS)
Home Language	10	8/7	8/7
First Additional Language		2/3	3/4
Mathematics	7	7	7
Life Skills Beginning Knowledge Creative Arts Physical Education Personal and Social Well-being	**6** (1) (2) (2) (1)	**6** (1) (2) (2) (1)	**7** (2) (2) (2) (1)
TOTAL	**23**	**23**	**25**

(b) Instructional time for Grades R, 1 and 2 is 23 hours and for Grade 3 is 25 hours.

(c) Ten hours are allocated for languages in Grades R-2 and 11 hours in Grade 3. A maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 2 hours and a maximum of 3 hours for Additional Language in Grades 1-2. In Grade 3 a maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 3 hours and a maximum of 4 hours for First Additional Language.

(d) In Life Skills Beginning Knowledge is allocated 1 hour in Grades R-2 and 2 hours as indicated by the hours in brackets for Grade 3.

1.4.2 Intermediate Phase

(a) The instructional time in the Intermediate Phase is as follows:

SUBJECT	HOURS
Home Language	6
First Additional Language	5
Mathematics	6
Natural Sciences and Technology	3,5
Social Sciences	3
Life Skills Creative Arts Physical Education Personal and Social Well-being	**4** (1,5) (1) (1,5)
TOTAL	**27,5**

1.4.3 Senior Phase

(a) The instructional time in the Senior Phase is as follows:

SUBJECT	HOURS
Home Language	5
First Additional Language	4
Mathematics	4,5
Natural Sciences	3
Social Sciences	3
Technology	2
Economic Management Sciences	2
Life Orientation	2
Creative Arts	2
TOTAL	**27,5**

1.4.4 Grades 10-12

(a) The instructional time in Grades 10-12 is as follows:

SUBJECT	TIME ALLOCATION PER WEEK (HOURS)
Home Language	**4.5**
First Additional Language	**4.5**
Mathematics	**4.5**
Life Orientation	**2**
A minimum of any three subjects selected from **Group B** Annexure B, Tables B1-B8 of the policy document, *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12,* subject to the provisos stipulated in paragraph 28 of the said policy document.	**12 (3x4h)**
TOTAL	**27,5**

The allocated time per week may be utilised only for the minimum required NCS subjects as specified above, and may not be used for any additional subjects added to the list of minimum subjects. Should a learner wish to offer additional subjects, additional time must be allocated for the offering of these subjects.

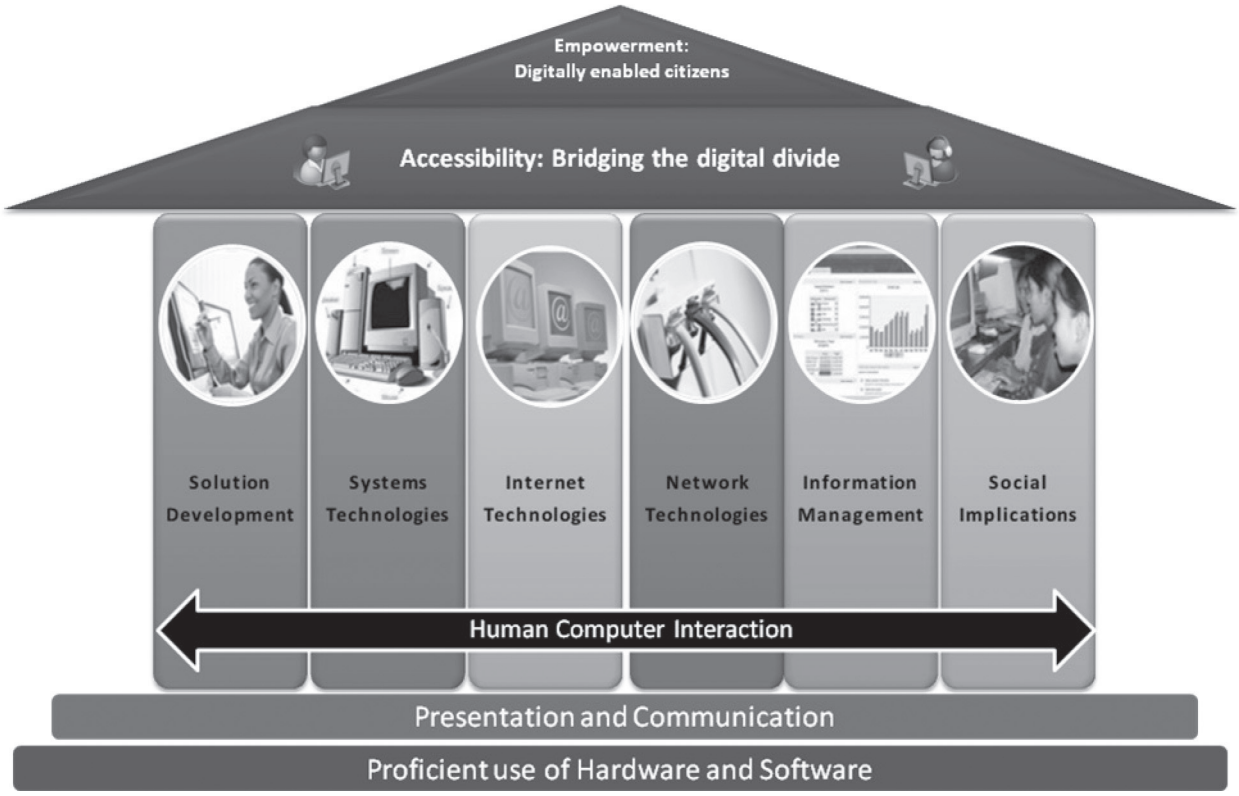
SECTION 2

COMPUTER APPLICATIONS TECHNOLOGY

2.1 What is Computer Applications Technology?

Computer Applications Technology is the study of the integrated components of a computer system (hardware and software) and the practical techniques for their efficient use and application to solve everyday problems. The solutions to problems are designed, managed and processed via end-user applications and communicated using appropriate information and communication technologies (ICTs). ICTs are the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge.

The diagram below illustrates how the main topic areas of the Computer Applications Technology subject support the teaching of digitally enabled learners.



The table below sets out the topics and sub-topics in the Computer Applications Technology curriculum.

Topic Area	Sub-topics	Weighting (Volume)	Resources
Solution Development	Word Processing Spreadsheets Databases Fourth Application	60%	Computers Textbook Internet Access • Web Browser • Search Engine Office Suite • Word Processor • Spreadsheet • Presentations • Database HTML Editor (Notepad) Typing Tutor Security Software (Anti-virus/Internet Security)
Systems Technologies	Concepts of Computing Hardware Software Computer Management	13%	
Network Technologies	PANs LANs and WLANs WANs	5%	
Internet Technologies	Internet and World Wide Web E-communications	5%	
Information Management	Find and Access Data and Information Process Data and Information Present Solution	12%	
Social Implications	Impact on Society Legal and Ethical and Security Issues Health and Ergonomic Issues Environmental Issues	5%	

Topic links and overlap

It is important to note that there will always be a degree of overlap between topics. Solution development is enabled by systems technologies in the form of application software. Systems technologies allow for electronic communication. Network technologies enable the Internet that is used for various applications, which include information dissemination and electronic data interchange. Information management is a key concept and secondary activity overlapping concepts in many other areas such as solution development and Internet technologies. Information management is enabled by systems technologies. All ICT activities are primarily driven by human involvement, human need and intervention, which in turn give rise to social and ethical issues.

For example, when one deals with Information Management, one could incorporate the topic with Internet Technologies and application software from Solution Development. This is also applicable to the Systems Technologies topic where the relevant Social Implications could be highlighted.

2.2 Specific aims of CAT

In Computer Applications Technology a learner will:

- use end-user software applications proficiently to produce solutions to problems within a defined scenario;
- understand the concepts of ICTs with regard to the technologies that make up a computing system;
- understand the various technologies, standards and protocols involved in the electronic transmission of data via a computer-based network;
- use the Internet and the WWW and understand the role that the Internet plays as part of the global information superhighway;
- find authentic and relevant information, process the information to draw conclusions, make decisions and communicate the findings in appropriate presentation media; and
- recognise the legal, ethical, environmental, social, security and health issues related to the use of ICTs and learn how to use ICTs responsibly.

2.3 Time allocation in the curriculum

In Grades 10 and 11 the time allocation for CAT is 4 hours per week for 35 weeks. 5 weeks of the school year are taken up by examinations.

The Grade 12 time allocation is 4 hours per week for 28 weeks; 12 weeks of the school year are for examinations.

The table below provides suggestions for the ***approximate*** teaching time per topic:

Topic	Grade 10	Grade 11	Grade 12
Solution Development	80 hours / 20 weeks	86 hours / 21.5 weeks	58 hours / 14.5 weeks
Systems Technologies	22 hours / 5.5 weeks	14 hours / 3.5 weeks	16 hours / 4 weeks
Network Technologies	6 hours / 1.5 weeks	4 hours / 1 week	6 hours / 1.5 weeks
Internet Technologies	8 hours / 2 weeks	10 hours / 2.5 weeks	6 hours / 1.5 weeks
Information Management	16 hours / 4 weeks	18 hours / 4.5 weeks	20 hours / 5 weeks
Social Implications	8 hours / 2 weeks	8 hours / 2 weeks	6 hours / 1.5 weeks
Total Contact Time	*140 hours / 35 weeks*	*140 hours / 35 weeks*	*112 hours / 28 weeks*
Examination	*20 hours / 5 weeks*	*20 hours / 5 weeks*	*48 hours / 12 weeks*
Total - 1 academic year	**160 hours / 40 weeks**	**160 hours / 40 weeks**	**160 hours / 40 weeks**

2.4 Resources required to offer Computer Applications Technology

Infrastructure, equipment and finances for the subject are the responsibility of the school.

In Computer Applications Technology learners are required to work individually on a computer during contact time and need access to the Internet.

Schools should have a business plan for the subject that addresses the following:

- Initial capital layout for setting up a computer laboratory. The layout should provide for the following:
  - Entrance level computers (to ensure a lifespan of 4 - 5 years), networked
    - o One computer per learner per period (during contact time)
    - o Provision for sufficient computers to enable the practical examination to be completed in **two sittings**
  - Internet access
- One high-speed printer per network
- Data projector or demonstrating software
- Software (operating system, Office suite, security software - antivirus, Internet)
- Budget
  - Annual running costs
    - o Software licensing (operating system, application software, security software)
    - o Cartridges, paper, storage media
    - o Breakage and maintenance (regular service plan)
    - o Insurance
    - o Internet connectivity
  - Sustainability plan
    - o To upgrade or replace software and equipment every 4 - 5 years.

SECTION 3

CONTENT AND SCOPE PER TOPIC

3.1 Solution Development

Solution development is the actions and processes involved in developing a computer-based solution by utilising appropriate tools such as application packages to solve a variety of problems represented by real-life scenarios. For Computer Applications Technology these applications are end-user applications which include word-processing, spreadsheet, database and presentation applications.

	Word Processing	Spreadsheets	Databases	Fourth Application
Grade 10	• Documents • Basic file management • Text, paragraphs and page functions and manipulation • Lists and columns • Graphics, shapes and diagrams • Tables • Formatting and editing • Introduction to review and proofing functions • Basic templates • Introduction to integration • Basic troubleshooting	• Workbooks and worksheets • Cells, rows, and columns • Formatting and editing • Introduction to calculations • Introduction to formulae and functions • Introduction to charts/ graphs • Introduction to error indicators • Basic file management • Introduction to integration • Basic troubleshooting		**Presentations** • Slide design and layout elements • Editing and formatting • Text and lists • Charts, illustrations and tables • Slide manipulation • Basic custom animation • Slide show • Introduction to integration
Grade 11	• File management • Advanced document layout • Customising • Reviewing tools and proofing functions • Electronic forms • Mail merge • Styles • Sections • Reference functions • Integration techniques • Troubleshooting	• Advanced formatting • Advanced formulas and functions • Error indicators • Graphs/charts • Manipulate worksheets • Import/export data • Integration techniques • Troubleshooting	Basic skills and basic knowledge in working with • Tables: Records, fields and data types • Record manipulation • Basic field properties • Formatting and editing • Forms • Basic data validation • Basic queries • Simple reports • Calculations • Integration techniques	**HTML / Web design** • What is HTML? • HTML syntax • Basic HTML tags • Basic text and text formatting • Structure of a simple HTML page • HTML links • HTML images • HTML lists
Grade 12	• Advanced file handling • Customise templates • Import/export data • Data sources • Professional documents • Use/reinforce word processing skills • Integration techniques • Troubleshooting • Problem solving	• Complex functions • Text manipulation • Date and time calculations • Advanced graphs/ charts • Validation of data • Integration • Troubleshooting • Problem solving	• Reports • Grouping information • Calculation fields in queries and reports • Data validation techniques • Troubleshooting • Problem solving	**HTML / Web design** • HTML tables

Note:
The various techniques, tools and features of the respective application packages should be taught so as to develop a computer based solution, as an end-user, within different scenarios and using a variety of applications effectively and efficiently. Applications packages share common features that are reinforced when working with the different applications.

3.2 Systems Technologies

Systems technologies refer to the physical and non-physical components of a computer system. The components of the system are independent units which are designed to perform a particular function. These components which include hardware, peripherals and software components are connected as a unit to perform the basic functions of a computing system, which include input, processing, output, storage, communication and transfer of data in an electronic format.

	Introduction to Concepts of Computing	Hardware (Systems Unit)	Software	Computer Management
Grade 10	• Describe ICTs • General model of a computer • Introduction to data and information • Types of computers • Role of computers • Advantages and disadvantages of computers • ICTs in everyday life - overview and introduction	• Describing hardware • Hardware components • Ports and connectors • Hardware configuration • I/O devices • Storage devices and media • Processing concepts	• Describing software • Software components • Definition and overview of system and application software • Classification of software • Purpose and use of software • Introduction to operating system concepts	• Introduction to using computers - working environment and keyboarding • Introduction to files and folders • File Manager • Print management • Adding hardware
Grade 11	• Information processing cycle • Role of ICTs • Types of computers • Computer categories	• Input, output, storage and processing • Mobile technology • Portable devices • Devices for physically challenged users • Alternative I/O and storage devices	• Software updates, versions and compatibility • Application software • System software • Web applications • Software for physically challenged users • System requirements • Help files	• Software installation • File management • System properties • Basic trouble-shooting
Grade 12	• Computer systems for different uses • Case studies/scenarios regarding use of ICTs • Use of computers in a variety of contexts	• Appropriate use of devices • Buying decisions • Productivity issues • Factors influencing performance • Case studies • New technology	• Productivity issues • Role of operating system • Utilities • Buying decisions • Human error potential • Case studies • New technology	• File properties, attributes and metadata • Housekeeping • Case studies • Troubleshooting

Note:
Hardware and software should be dealt with at a non-technical level, but such that will enable the learner to:

- *understand the concepts that make up a computer system;*
- *demonstrate knowledge and understanding of the functions and uses of the main hardware and software components of a computer system;*
- *select the right software for a task;*
- *troubleshoot at an elementary level or select the most appropriate hardware for a given scenario;*
- *know whether to upgrade or buy new equipment;*
- *be aware of new trends and developments and how to integrate these with existing or new equipment;*
- *know how technology can benefit the user in specific contexts; and*
- *understand the operations involved in the management and optimal utilisation of a computer system.*

Content in this focus area should be taught from a basis of familiar contexts to unfamiliar contexts (new trends and developments). This focus area lends itself meaningfully to integrate content from the Social Implications and Internet and Network Technologies focus areas, and should be taught in this way.

3.3 Network Technologies

Network technologies include various network technologies to facilitate the management and dissemination of digital data from one point to another. Network technologies also refer to the electronic systems used for electronic data interchange used to facilitate information dissemination between various individuals or groups at a single point or dispersed locations.

	Networks
Grade 10	• Introduction to networks and network concepts • Aims and objectives of networks • Advantages and disadvantages of using networks • Types of networks: PAN/HAN • Internet access
Grade 11	• Types of network: LAN and WLAN • Basic components of network • Connection • Intranet • Introduction to network security concepts
Grade 12	• Types of networks: WAN • Internet as a WAN • Internet services • Buying decisions regarding Internet connection and access

Note:

Internet Technologies should be dealt with at a non-technical level, but such that will enable the learner to:

- *understand the role that the Internet and the WWW play as part of the global information superhighway and the contribution towards the digital age;*
- *introduce the software involved to render the Internet as a service;*
- *understand the concepts of the technologies and standards implemented to enable electronic communication*;
- *troubleshoot at an elementary level and find the most workable ways to approach Internet problems;*
- *understand how technology can benefit specific scenarios; and*
- *be aware of new trends and developments.*

3.4 Internet Technologies

Internet technologies include the WWW and all interrelated processes in the digital presentation of multimedia data on a web page. Internet technologies are defined as a set of related and interconnected technologies which enable the establishment of global networks, for various purposes such as collaboration, electronic data interchange, electronic commerce, electronic communication and social networking.

	Internet and WWW	**Electronic Communications**
Grade 10	• Introduction to the Internet and World Wide Web • Overview of the Internet and WWW • Internet and web addresses • Types of websites • Overview of browsers and search engines • Browsing and searching techniques	• Introduction to electronic communications • Overview of e-communication • Overview of applications/tools to facilitate electronic communications • E-mail as a form of e-communication • E-mail software features • Introduction to the use of Internet and e-mail • Netiquette
Grade 11	• Overview of online services • Features of browsers • Web page and websites • Website usability issues • Limitations of fixed Internet access • Portable and mobile Internet access	• Types of digital communications • Uses of computer communications • Managing e-mail
Grade 12	• Overview of Internet services • Features of browsers • Browser plug-ins • Evaluation of websites • New trends and technology	• Communication devices • Extension of types of digital communications • Advantages, disadvantages and limitations • Good practices • Extension of uses of computer communications • New trends and technology

Note:

Internet Technologies should teach learners to:

- *understand the role that the Internet and the WWW plays as part of the global information super-highway and the contribution towards the digital age;*
- *introduce the software involved to render the Internet as a service;*
- *understand the concepts of the technologies and standards implemented to enable electronic communication;*
- *troubleshoot at an elementary level and to find the most workable ways to approach Internet problems;*
- *understand how technology can benefit specific scenarios; and*
- *be aware of new trends and developments.*

3.5 Information Management

Information management refers to the techniques and technologies involved in the collection, storage, processing of data into information that leads to knowledge and decision-making. It includes the use of appropriate communication and presentation tools to communicate new knowledge and recommendations.

	Find and Access Data and Information	Process Data and Information	Present Solution
Grade 10	• Data vs information • Understanding of the problem/ task • Role of questions and questioning - Using questions • Utilising a plan to solve the problem/carry out the task • Types of information sources • Information and data gathering - Using a questionnaire - Using one other source	• Information vs knowledge • Information sifting • Engaging with information • Tools and techniques for manipulating information - Make notes and summarise • Ethical use of information • Processing data • Utilising data questions • Data handling - the role of the spreadsheet	• Knowledge vs insight • Utilising specific software tools to communicate findings • Simple report • Personal understandings • Organise information into logical groupings and flow • Findings/conclusions • Copyright and plagiarism • Acknowledgement
Grade 11	• Task definition in different contexts - understanding the problem/task • Questions and questioning - Utilising main question - Formulating other questions - Quality control of questions • Indentifying appropriate sources • Information and data gathering - Add questions to questionnaire - Using one other source • Quality control of information	• Extracting appropriate information • Utilising appropriate tools and techniques to process data/ organise and manipulate information • Processing data • Adding data questions • Data handling - the role of the spreadsheet and the database • Analysis of data and information - Trends and patterns	• Utilising appropriate software tools to communicate findings • Report • Interpreted knowledge and understanding • Cohesive and logical organisation and flow of content and recommendations/conclusions • Communication using supporting texts and graphics • Copyright and plagiarism issues • Appropriate referencing
Grade 12	• Reformulation of problem/task into a complete statement • Questions and questioning - Formulate main question - Formulating other questions - Quality control of questions • New questions and discarding irrelevant questions as investigation develops • Indentifying appropriate sources • Finding information and gathering data - Set a questionnaire - Using two other sources • Advanced searching techniques • Quality control of information - Information evaluation - Website evaluation • Manage volumes of information	• Using a variety of information • Using the most appropriate information and data for processing • Effective manipulation of information - Rework and/or combine • Processing data correctly into useful information using a variety of tools and techniques leading to a solution • Use correct software for processing and manipulation • Formulating data questions • Data handling - the role of the spreadsheet and the database • Meaningful analysis of data and information - trends and patterns	• Utilising best software tools in an integrated fashion to communicate findings • Comprehensive report • Interpreted knowledge and new understanding • Present information in logical grouping and flow supported by appropriate texts and graphics to enhance understanding • Cohesive and logical recommendations/conclusions • Complete referencing using variety of tools and techniques • Quality control of report - Clear link between original task/problem, discussion and conclusion

The learner should:

- *understand the role and uses of data and information;*
- *know how to determine what information/data is needed to complete a task/solve a problem;*
- *know where to find information to complete a task/solve a problem;*
- *know how to access and gather data and information;*
- *know how to evaluate the authenticity of information;*
- *know how to process data/manipulate information to assist interpretation thereof or in generating new understanding;*
- *be able to make informed conclusions/recommendations based on interpretation of knowledge and new understanding; and*
- *be able to present and communicate the solution/findings in appropriate presentation media.*

Most of this content can be taught and reinforced through the Practical Assessment Task (PAT).

3.6 Social Implications

Social implications refer to issues relating to the digital age and bridging the digital divide and include issues that lead to the responsible use of ICTs. This section of the CAT curriculum should consider the impact the use of computer technology has on everyday life.

	Impact on Society	Legal and Ethical and Security Issues	Health and Ergonomic Issues	Environmental Issues
Grade 10	• ICTs in everyday life • ICT influence on life and life styles • Influences on life and life styles • Economic reasons for using computers • Communication etiquette • Safe Internet and e-mail use	• Ethical use of computers • Basic security concepts • Software piracy • Intellectual property • Licensing • E-mail threats, issues and remedies • Computer criminals	• Ergonomics to promote health and well-being	• Green computing issues • Environmental issues relating to the use of ICTs
Grade 11	• Enhancing accessibility • Computer and human error • Impact of ICTs in the workplace and employment practices • Social engineering tricks • Online safety and protection issues	• Hardware theft and vandalism • Ethical use of networks • Unauthorised access • Network safety and security • Privacy issues • Information accuracy • Data protection • Computer misuse • Currency of protective software	• Factors that influence health • Health risks	• Power settings and savings
Grade 12	• Distributed computing power • Impact and use of social networking and virtual communities • Tele-working/tele-commuting • Information overload • Different scenarios and case studies • Making recommendations • New issues	• Computer criminals and crimes • Fraud scams • Internet attacks • Misuse of personal information • Malware and safeguards • Different scenarios and case studies • Making recommendations • New issues	• User-centred design in software • Usability and functionality issues • Interpret adverts • Interpret scenarios • Making recommendations • Buying decisions • New issues	• Interpret scenarios • Make recommendations • New issues

Note:

Learners should be able to:

- *provide an overview and understanding on how ICTs impact modern-day living;*
- *be aware of computer related threats; and*
- *use ICTs responsibly.*

Most of the content of Social Implications should be dealt with and integrated with other topics. The time scheduled for this topic could therefore be added to other topics.

3.7 Suggested teaching plan

The suggested teaching plan indicates the minimum content to be covered per term. The sequence of the content or topics listed per term **is not prescribed.** Teachers should design their own work schedules (or use/adapt the work schedule provided in their textbook) to teach the content per term in **appropriate sequence** and pace.

The sub-topics presented in the term plans should not be seen as stand-alone topics. Relevant sub-topics or content could be presented in an integrated manner. Integrating the topics in the lesson presentation should flow naturally due to the nature, links and 'overlap' of the content. Some content from one sub-topic may strengthen and underpin the content of another. This approach should be applied throughout the three-year curriculum.

It is important that the specific technologies in the teaching plans are revised at regular intervals to phase out old technologies and to include new technologies.

As the length of terms varies from one year to the next, the teaching plan/work schedules should be adapted accordingly on a year-to-year basis.

GRADE 10

CONTENT (Grade 10 / Term 1)	NOTES
Systems Technologies: Introduction to Computers **(Theory) (± ½ week / 2 hours)** • Explain what a computer is: - Overview of a general model of a computer in relation to the information processing cycle: input, processing, output, storage as well as communication • Overview of the different types of computers: - Multi-purpose devices such as o Desktop, laptop, netbook, tablet, server, smart phone and media player - Dedicated devices such as ATMs and electronic appliances (embedded computers) • Overview and concepts of the main components of a computer system: - Hardware and software - Devices: Input, output, storage and communication • ICTs used in everyday life: - Define and explain the term Information and Communication Technology (ICT) - Overview of a general model of an ICT system: Convey, manipulate and store data - Example of an ICT system in a familiar context such as a point of sales system or a cell phone • Concepts of data and information: - Explain the difference between data and information and the importance of each - Give examples of uses of data and information within a familiar organisation such as the school	
Systems Technologies: Computer Management **(Practical) (2 weeks / 8 hours)** • Start up - switch on the computer, log on (concept of access control) • Desktop: First looks, icons and shortcuts • Introduce the desktop: - Features such as: Start button, task bar, My Computer, My Documents, Recycle Bin, widgets, file manager, e.g. Windows Explorer • Access programs such as typing tutor • Introduction to keyboard and keys: QWERTY, Tab, Caps Lock, Backspace, Shift, etc. • Use of a typing tutor (freely available as open source) • Using the keyboard correctly - correct fingers and correct keys • Basic file operations: open, save, close and basic printing	• Keyboarding drills using a typing tutor - learners should be able to use the correct fingers on the correct keys • Dealing with correct posture provides a learning opportunity to introduce ergonomics and health issues
Systems Technologies: Computer Management **(Theory and practical) (±½ week / 2 hours)** • Describe file organisation • Basic concepts and introduction to file organisation: drives, folders and files - Examples of different types of files - File extensions (association) - common/generic extensions such as o archived/compressed, forms of text files, web pages o applications like word processor, spreadsheet, database and presentations o graphics, movie, sound, animation o Adobe Acrobat • File specification: Drive, path, filename and file extension • Files: File naming, conventions and properties - types and size • File manager, e.g. My Computer, hierarchy • Organise, copy, rename, delete, restore, move, view and sort files and folders	• Introduce file organisation with use of typing tutor when busy with keyboarding skills • Reinforce file organisation when dealing with word processing, spreadsheets and presentations

CONTENT (Grade 10 / Term 1)	NOTES

Systems Technologies: Hardware

(Theory) (±½ week / 2 hours)

- What is hardware?
- Overview of basic concepts relating of hardware:
  - Identify hardware components
  - Identify ports and connectors such as network ports, USB and FireWire
- **Input:**
  - What is input?
  - Types of input:
    - Data - unprocessed text, numbers, images, video and audio
    - Instructions - programs, commands and user response
  - What is an input device?
  - Generic/common input devices: Keyboard - external (desktop), built-in (laptop) and mouse (optical, wireless)
- **Output:**
  - What is output? Types of output: text, graphics, audio and video
  - Hard copy vs soft copy
  - What is an output device?
  - Generic/common output devices: LCD monitors (size, quality) and printers (inkjet and laser: speed, quality, cost)
- **Storage:**
  - What is storage?
  - What is a storage device? What is storage media?
  - Examples of generic/common storage devices and media: hard disks (fixed and portable) and USB flash drives
    - Measuring capacity (KB, MB, GB and TB) of storage media
    - Volatility, capacity of storage media

Systems Technologies: Software

(Theory) (±½ week / 2 hrs)

- Overview of the basic concepts and introduction to software:
  - What is software? Identify software components
  - Concept of a graphical user interface (GUI)
  - Identifying and using typical components of a GUI such as icons, toolbars, menu usage and navigation, radio buttons, checkboxes, dialogs, lists and combo boxes
  - Minimising, restoring, resizing, moving and closing windows
  - System software vs application software
  - Basic accessories such as calculator, paint and snipping tool
- Application Software - Overview of basic concepts and introduction
  - What is application software?
  - Common/generic examples such as Office suites, financial applications, designing and gaming/entertainment
- System Software - Overview of basic concepts and introduction
  - What is system software?
  - Operating system - basic function/purpose, typical features of a GUI
  - Examples of operating systems
- Administering security (PC/laptop) - log on, user name, password (concept of authentication)

CONTENT (Grade 10 / Term 1)	NOTES
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content: Ergonomics, green computing (recycling, e-waste), health (posture) and authentication (user ID, passwords) • Economic reasons for using computers: Saving paper, labour, communication costs, efficiency, accuracy and reliability	• Social implications should be taught as they relate to hardware, software and applications
Solution Development: Word Processing **(Practical and theory) (±5½ weeks / 22 hours)** • What it is used for? • First looks: Workspace features such as ribbons, tabs and menus • File management in word processor: Open new and existing documents, close, save, save as and print • Select data using keyboard and/or mouse • Text: entering, editing and deleting text • Basic punctuation - one space after all punctuation, including periods • Formatting marks • Formatting - Font type, style, size, colour, highlight and effects - Paragraph: spacing, alignment, borders, shading and indents (simple) - Using existing quick styles in gallery (simple) • Editing: cut, copy, paste, find and replace • Reviewing: proofing: spelling and grammar • Autocorrect and basic word processing typography: Quotes, dashes and emphasis • Page layout: page setup: margins, orientation, size and page border • Document layout: page numbers, page breaks and symbols • View options - print layout and preview • Insert and manipulate illustrations and text - Pictures, clip art, word art, shapes, charts and smart art - Text box	• Reinforce keyboarding skills when working with word processing content - allocate time for keyboarding drills using a typing tutor • Motivate learners to persist with correct keyboarding techniques when dealing with the word processor • GIGO principle
Assessment (PoA): 1 practical test + 1 theory test covering content taught **Reporting: Add raw marks and totals and convert to % for term mark**	

CONTENT: (Grade 10 / Term 2)	NOTES

Systems Technologies: Hardware
(Theory) (±½ week / 2 hours)

Extend hardware concepts

- **Input** (Basic concepts, features and uses)
  - Pointing devices
    - o Touch pad, trackball, pointing stick, touch screen, pen input and joystick
  - Digital camera
  - Scanning and reading devices
    - o Flatbed, handheld and sheet feed scanners
    - o Radio-frequency identification (RFID), magnetic stripe, magnetic ink character recognition (MICR) and optical mark recognition (OMR), bar-coding
    - o Optical character recognition (OCR)
  - Video input - video camera and webcam
  - Audio input: Microphone and voice recognition
  - Biometric input, e.g. fingerprint scanners
- **Output** (Basic concepts, features and uses)
  - Audio output: What is an audio output device?
    - o Headsets and speakers
  - Other output
    - o Fax/fax modem, multifunction devices, data/DLP projector
- **Storage media and devices** (Basic concepts, features and uses)
  - CDs, DVDs and Blu-Ray
  - Memory cards
- **Processing**
  - Overview of the basic concepts and introduction of the system unit:
    - o Motherboard, CPU and memory (RAM, ROM)
    - o Measuring speed in GHz

Systems Technologies: Software
(Theory) (±½ week / 2 hours)

Extend software concepts

- Stand-alone vs integrated software
- Freeware, shareware and proprietary software
- Open source software - definition, benefits and disadvantages
- Licensing and licensing agreements including end-user, site license agreements and creative commons
- System software
  - Drivers: What is a driver?
  - Utility programs: What is it? / Purpose
  - Examples of generic/common utility programs such as backup

Systems Technologies: Computer Management
(Practical and theory) (±½ week / 2 hours)

- Creating shortcuts
- Taking screenshots
- Adding new peripheral such a printer - USB and Plug-and-Play (PnP)
- Changing the default printer
- Basic printing and printer queue management - personal computer
- Compressing/decompressing files and folders

Network Technologies: Networks
(Theory) (±½ week / 2 hours)

Overview of the basic concepts and introduction to networks:

- What is a network?
- Aims and objectives of networks
- Advantages such as facilitating communications and sharing hardware, software, data and information; and electronic funds transfer (EFT)
- Disadvantages such as security and privacy issues
- Internet as an example of a network

CONTENT: (Grade 10 / Term 2)	NOTES
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content: Ethical use of computers, care of PC system and storage devices • Software piracy, licensing and intellectual property	
Solution Development: Word Processing **(Practical and theory) (±3 weeks / 12 hours)** • Paragraphs (basic) - Bullets and numbering (basic) - Indents (hanging) - Tabs • Document and page layout - Customising margins - Headers and footers • Tables - Insert, Table tools, Table design, Table properties - Design: Table styles, borders and shading - Layout: Rows and columns, header rows - Cells: size, distribution, merging and splitting - Text alignment and direction - Table: split, auto fit, gridlines - Working with data: sorting, convert to text and working with formulae • View options - Work with more than one document/window, zoom • Document views: Draft and full screen reading	Though teaching and practising the mechanical/technical skills and functions of applications are important for the learner to become familiar with the tool that he/she uses, it is important to do so within the paradigm of computational thinking. It is important that learners are also taught the underlying knowledge and understanding of these skills and the applications they are working with. It should be taught in a way that learners will be able to transfer the skills and knowledge to new versions of the applications as well as other similar applications.
Solution Development: Spreadsheets **(Practical and theory) (±2 weeks / 8 hours)** • Overview of the basic skills and core concepts of spreadsheets • Uses • First looks: Workspace - Rows, columns, cells, sheets and workbook • Cell reference - The importance of using cell references rather than constant values in cells and formulae • Cell ranges • Data types such as General, Number, Currency, Date and Time • Values and contents • Format cells: Data type, borders, shading, alignment, wrapping, merge, alignment, text direction, merge, split and auto fill • Formatting rows, columns and sheets - Size (width and height), insert, delete, hide, unhide, borders and styles • Reinforce generic/common concepts such as formatting and editing, page layout, illustrations, search and proofing as in word processor • File options: open, save, save as, new and print • Basic calculations using basic operators including +, -, *, /, order of precedence and the use of brackets • Error indicators: - #######, #NAME!, #DIV/0!, #REF! - #VALUE!, #NUM!	

CONTENT: (Grade 10 / Term 2)	NOTES
Information Management **(Practical and theory) (±½ week / 2 hours)** • Data vs information • Understand the problem/task - Problem solving steps - Role of questions and questioning to determine information needs • Information sources and data gathering tools - Electronic reference works, e.g. Encarta, Internet - Printed media, e.g. books - Surveys/questionnaires and people, e.g. interviews	• Understand the problem: - State in own words; determine what needs to be done/found; - What is known? - What information is missing or needed? - Find information and data: where and how? • Preparation for PAT
Assessment (PoA): 1 test + 1 examination (1 practical paper + 1 theory paper) **Reporting: Add raw marks and totals and convert to % for term mark**	

Note:

It is important to note that application packages share common features (formatting, editing, page layout, illustrations, etc.) that are reinforced when dealing with the different packages and as these features may take more time with the first application taught, they take up less time when teaching subsequent packages.

CONTENT: (Grade 10 / Term 3)	NOTES
Network Technologies: Networks **(Theory) (±½ week / 2 hours)** Overview and basic concepts: • Personal area network (PAN) / Home area network (HAN) - What is it? / What is it used for? / What does it offer? - Advantages, disadvantages and limitations - What is needed to create a PAN/HAN? • Network device: Modem, router and switch • Communication channel/media • Obtaining Internet access: - Identify hardware and software needed for connecting to the Internet using a PC • ISP - Definition and purpose	
Internet Technologies: Internet and WWW **(Theory) (±½ week / 2 hours)** • Internet - What is the Internet? - Internet addresses • Overview of the World Wide Web (WWW) - Describe the WWW - Web address/uniform resource locater (URL) - Web page, website, hyperlink - Types of websites, their purpose/what they offer and examples o Portal, news, informational, business, Weblog (blog), Wiki, online social network, educational, entertainment, advocacy, web application, content aggregator, personal • Browsers - What is it? / Purpose - Tabbed browsing • Search engines - What is it? / Purpose - Common/generic examples • Basic browsing and searching techniques - Keywords/key phrases - Search engine operators • Concept of downloading and uploading	
Internet Technologies: Communication **(Theory) (±½ week / 2 hours)** • What is e-communication? • What is a communication device? • E-communication using a PC • Overview of applications to facilitate e-communications: e-mail, web browser, instant messaging, text, picture and video messaging, mailing list, Weblog - What is it? - What does it offer? / Purpose • E-mail as a form of e-communication - Taxonomy of e-mail addresses - ISP vs web-based e-mail - E-mail software features such as Cc and Bcc fields, attachments and address books • Fax/computer fax, fax to e-mail • Netiquette	

CONTENT: (Grade 10 / Term 3)	NOTES
Internet Technologies: Communications **(Practical) (±½ week / 2 hours)** • Basic use of the Internet and e-mail • Hyperlinks • Apply netiquette rules such as spelling check, messages, being courteous and concise, not gossiping, reducing the size of attachments and not typing in capital letters • Basic e-mailing - Compose messages - Send and receive, forward, reply to, reply to all • Attachments	
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content • Recognise and acknowledge the ownership of electronic material • Appropriate communication etiquette • E-mail threats, issues and remedies - Viruses, trojans, worms, hoaxes, spam, phising, e-mail spoofing and pharming • Safe e-mail and Internet use - dangers and tips to ensure safe use	
Solution Development: Presentations **(Practical) (±2 weeks / 8 hours)** • Overview of the basic skills and core concepts • Uses • First looks: Slides, designs, layouts • Formatting - Font type, style, size, colour, highlight, alignment - Paragraph: spacing, alignment, bullets, indentation • Editing: Cut, copy, paste, find, replace • Text: Entering, editing and deleting text • Reviewing/proofing: spelling and grammar • Page setup - Orientation, size • Slides: Insert, delete, numbers, headers and footers • View options - normal, slide sorter, notes, slide show • Insert illustrations, tables • Custom animations (basic) • Basic integration techniques • Start slide show	
Solution Development: Spreadsheets **(Practical and theory) (±2½ week / 6 hours)** • Formulae vs functions • Know and use basic functions such as: - sum, average, count, min, max, today, rand, mode, mean, countif and use of relational operators (> < <= >= <> =) • 'Round' numbers using cell formatting • Sorting • Work with sheets - rename - headers and footers - printing • Introduction to graphs	

CONTENT: (Grade 10 / Term 3)	NOTES
Solution Development: Word Processing **(Practical and theory) (±1½ weeks / 6 hours)** • Reviewing - Comments - Protecting document • Document layout - Page setup o Columns, hyphenation - Watermark, page colour • Integration - Hyperlinks	
Information Management and Practical Assessment Task **(Practical) (±1½ week / 6 hours)** • Information vs knowledge • Find and access information and data - Role of surveys and questionnaires • Sifting information - Process of keeping only gathered information that meets the criteria/will solve the problem	• Practical Assessment Task - Information Management culminates in the PAT • Start with the PAT where learners will apply the theoretical and practical content, concepts and skills of Information Management and the use of applications in an integrated fashion
Assessment (PoA): 1 practical test + 1 theory test **Reporting: Add raw marks and totals and convert to % for term mark**	

<table>
<tr><th>CONTENT: (Grade 10 / Term 4)</th><th>NOTES</th></tr>
<tr><td colspan="2">
Content using case studies
(Practical and theory) (±1 week / 4 hours)
• Consolidate content, concepts and skills using case studies to:
- Identify the basic hardware configuration of a computer in terms of:
o the processor
o memory and
o hard drive size
- Understand computers and their uses
- Understand how technology helps one to operate more efficiently, effectively and more accurately
- Know how to use computers as tools to access information and to communicate with others around the world
- Make better buying decisions - interpret advertisements and make judgements about quality and usefulness when buying equipment and software
- Know how to fix ordinary computer problems and deal with challenges that arise from utilising computers (and know when to call for help)
- Know how to use the Internet and e-mail
- Make informed decisions and choices in selecting communication devices and proper modes of communications for a given scenario
- Know what kind of computer uses benefit or advance work place and career path opportunities
- Know how to protect oneself against online villains and threats
- Know how to apply digital tools to:
o communicate
o find and gather
o analyse
o use, manipulate and process information and
o solve problems
- Understand technology concepts, systems and operations
• Recommend specific hardware/software for a specific scenario
</td></tr>
<tr><td colspan="2">
Social Implications
(Theory) (±½ week / 2 hours)
• Impact on society
- Identify how ICTs influence one’s life and life styles
• Impact on home, office and education
• Computer criminals - types and what they do/how they operate
</td></tr>
<tr><td>
Solution Development: Word Processing
(Practical and theory) (±1 week / 4 hours)
• Templates: Letter, fax, report
• Accessing offline help including FAQs (frequently asked questions)
• Integration techniques
• Solve problems using word processor
• Troubleshoot basic word processing problems
</td><td rowspan="2">When working with applications, learners should be taught to use various methods and techniques to achieve the same objective, compare the methods and determine which one is more efficient or works best for them.

This will teach them not only to follow a specific instruction/set of instructions but also to complete a given task that involves careful thinking and reasoning about how to do it and if there is more than one way, to compare the methods and find the best way of doing it.</td></tr>
<tr><td>
Solution Development: Spreadsheets
(Practical and theory) (±1½ weeks / 6 hours)
• Graphs
- Pie, line, column/bar
- Purpose of each/when to use
- Create, format and edit
- Interpretation of information presented in a graph
• Basic integration techniques
• Solve problems using spreadsheets
• Troubleshoot basic spreadsheet problems
</td></tr>
</table>

CONTENT: (Grade 10 / Term 4)	NOTES
Solution Development: Documents **(Practical and theory) (±1 week / 4 hours)** (Word processor, spreadsheet, presentations) • Reproduce and create documents that incorporate text, graphics and data • Create documents using templates • Support communication with appropriate features such as images, symbols • Integrate text and graphics to form meaningful message • Balance text and graphics for visual effect • Use media, visual literacy and technology skills to create products that express understanding	
Information Management and Practical Assessment Task **(Practical) (±2 weeks / 8 hours)** • Knowledge vs insight/decision making • Manipulating information - Extract core meaning - Summarise using own words • Data handling using spreadsheet - Data questions: How many? What is most popular? What is least common? How many more than? What is the average? • Processing data • Presentation of information: - Graphs, tables, techniques and tools in word processor - Report writing - elements of a report: Introduction, body, conclusion, bibliography/references, copyright/plagiarism issues - Summarising information/report using presentation software • Finalise PAT	• Practical Assessment Task (PAT) - Information Management culminates in the PAT
Assessment (PoA): Practical Assessment Task + 1 examination (1 practical paper + 1 theory paper)	
Promotion mark: Convert term marks to 25%, convert PAT mark to 25%, convert paper 1 to 25%, convert paper 2 to 25%	

GRADE 11

CONTENT: (Grade 11 / Term 1)	NOTES
Systems Technologies: General Concepts **(Theory) (±½ week / 2 hours)** • Information processing cycle: Input, output, processing, storage and communication • Types of computers and typical features - Dedicated devices such as ATMs and electronic appliances - Mobile computers and devices such as smart phones - Client/server • Categorise computers - Portable (mobile)/non-portable - Processing power - Usage • The role of ICTs in the workplace	
Systems Technologies: Hardware **(Theory) (±1 week / 8 hours)** Extend from Grade 10 • **Input** - What is it? / Purpose / When to use - Advantages, disadvantages and limitations o Scanners and digital cameras • What determines the quality of digital cameras and scanning? Basic concepts o Biometric input o Input via PDAs, smart phones, tablet PCs, data collection devices o Terminals (POS), ATMs o Touch screens o Alternative input devices such as virtual keyboards, optical keyboards - Wireless technology • **Output** - What is it? Purpose / When to use - Advantages, disadvantages and limitations o Interactive whiteboards o Display devices • What determines the quality of monitors and printers? Basic concepts - Wireless technology • What software/other equipment is required, e.g. device drivers, OCR? • Input and output devices for physically challenged users	
Social Implications **(Theory) (±½ week / 2 hours)** • Options available for enhancing accessibility such as speech recognition, screen readers and magnifiers, on-screen keyboards, screen, mouse and keyboard settings • Hardware theft and protection • Power settings/saving and protection against power failure • Factors influencing health and health risks • Value of CAT - career options and further study	
Solution Development: Word Processing **(Practical and theory) (±3 weeks / 12 hours)** Reinforce content, concepts and skills from Grade 10 • File management - Printing (including options such as range of pages, odd or even, number of copies, print quality, pages per sheet), send to (e-mail, Internet fax, pdf), convert, properties • Input data from different file formats, e.g. text files, csv, rtf, tables • Editing: Paste special, find and replace (extend to more options) • Page layout: Themes	

CONTENT: (Grade 11 / Term 1)	NOTES
• Document layout - Section breaks and sections - Headers and footers (including date, path and filename) - Page numbers: Different first page, odd, even, starting from a specific number - Cover page • Paragraph: - Customise bullets and numbering - Outline numbering/multi-level lists - Customise spacing • Templates: Agenda, memo, basic resume/CV • Electronic forms • Import/export data • Online and offline help	
Solution Development: Spreadsheet **(Practical and theory) (±3 weeks / 12 hours)** • Reinforce content, concepts and skills from Grade 10 • Absolute cell referencing • Auto fill options • Using spreadsheet functions such as round, small, large, countif, counta, countblank, sumif, power and rand • Rounding off numbers and the difference between rounding and formatting • Conditional formatting • Interpreting error indicators such as: - circular reference - #NULL!	
Solution Development: Database **(Practical and theory)(±2 weeks / 8 hours)** • Uses • First looks: - Objects: Table, form, query, report • Tables: Records and fields, field names - Basic field properties: size/length, default value, decimal places, required • Data types - Text, number, date and time, currency, auto number, Yes/No and Memo • Database structure • Primary key • Create tables and forms • Enter data (records) • Add and delete records, fields • Formatting and editing • Sorting • Basic data validation techniques • Use filters • Work with different views, e.g. design and table view	
Assessment (PoA): 1 practical test + 1 theory test	
Reporting: Add raw marks and totals and convert to % for term mark	

Note:

It is important to note that application packages share common features (formatting, editing, page layout, illustrations, etc.) that are reinforced when dealing with the different packages and as these features may take more time with the first application taught, they take up less time when teaching subsequent packages.

CONTENT: (Grade 11 / Term 2)	NOTES
Systems Technologies: Hardware **(Theory) (±½ week / 2 hours)** • **Storage** - Primary storage (memory) vs secondary storage - Online storage o What is it? o Advantages/disadvantages - Suitable storage media for backup - How to write CDs, DVDs - Interpret adverts - Basic troubleshooting • **Processing** - Understand the role of basic components of the system unit o Motherboard - houses components o CPU - processing o RAM - holds data and instructions during processing/execution o ROM - stores start-up instructions • Overview and basic concepts of start-up process	
Network Technologies: Networks **(Theory) (±1 week / 4 hours)** • Local area networks (LAN and WLAN) - Definitions and where and why they are used? - Definition, purpose, role, uses - Advantages, disadvantages and limitations • Basic components of a network - Overview and concepts - Workstations and servers - Network interface card (NIC) - Network devices for connection - Communication medium - Network software • Connection - Wired vs wireless - Data transmission speed • Intranet - Definition and uses • Basic network security such as passwords, usernames and access rights	
Internet Technologies: Internet and WWW **(Practical and theory) (±½ week / 2 hours)** • Usability of web pages/websites - basic areas - Explore web pages/websites and evaluate aspects such as: o Readability, navigation, consistency, layout, typography - link to word processing documents and forms	
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content: - Unauthorised access - Ethical use of networks o Acceptable use policies of schools - Network safety and security issues - Privacy issues o spyware o adware o role of databases o respect privacy and products of others	

<table>
<tr><th>CONTENT: (Grade 11 / Term 2)</th><th>NOTES</th></tr>
<tr><td colspan="2">
Solution Development: Word Processing
(Practical and theory) (±1 week / 4 hours)
• Styles
- Quick style gallery (reinforce)
- Style set
- Change/edit a style
- Create a new style
</td></tr>
<tr><td colspan="2">
Solution Development: Spreadsheets
(Practical and theory) (±1½ week / 6 hours)
• Simple IF function
• Use of relational operators (> < <= >= <>) in simple IF functions
• Charts/graphs: Create, format and edit
- Meaningful titles and labels
- Gridlines
- Legends
- Options appropriate to the graph type chosen
• Integration techniques
</td></tr>
<tr><td colspan="2">
Solution Development: Database
(Practical and theory)(±1 week / 4 hours)
• Design database tables
• Choosing appropriate data types
- Text, number, date and time, currency, auto number, Yes/No, Memo, OLE object, hyperlink and Lookup
• Reinforce and extend the use of field properties: size/length, default value, decimal places, required, input mask, validation rule, validation text and alignment
• Queries:
- Design basic queries using and, or, not and sorting options
- Selecting which fields to display in a query
</td></tr>
<tr><td>
Solution Development: HTML / Web design
(Practical and theory) (±1 week / 4 hours)
• Reinforce the concepts of
- Websites, web pages, hyperlinks and URLs
• What is HTML?
• What is an HTML editor?
• HTML syntax
• Basic HTML tags: Opening tag and closing tag
<table>
<tr><th></th><th>Opening tag</th><th>Closing tag</th></tr>
<tr><td>Basic document tags</td><td><html>
<head>
<title>
<body></td><td></html>
</head>
</title>
</body></td></tr>
<tr><td>Heading elements</td><td><h1>
:
<h6></td><td></h1>
:
</h6></td></tr>
<tr><td>Text elements</td><td>

<hr /></td><td> </td></tr>
<tr><td>Text formatting</td><td>
</td><td>
</td></tr>
</table>
HTML comments
• Plain text and text formatting
• Structure and design of a simple HTML page
</td><td>
• The section on web design should be done in an HTML editor or text editor such as Notepad
• Learners are taught the basics of HTML in order to create and link web pages
</td></tr>
</table>

CONTENT: (Grade 11 / Term 2)	NOTES
Information Management **(Practical) (±1 week / 4 hours)** • Reinforce content, concepts and skills from Grade 10 • Task definition, data and information gathering • Quality control of information: - Evaluate questions (types/levels/variety) o Questions that can be answered explicitly by facts, e.g. questions starting with words such as What? When? Where? Who? How many? etc. o Questions that will help you to examine, explore, query, e.g. questions starting with Why? How? etc. o Questions that will help you to adjust alter or predict, e.g. questions starting with If? What if? etc. o Questions that will help you to make a judgment, critique, review or find meaning of some sort, e.g. questions starting with Would it be better if? What recommendation? How can I determine? What would be the best way? etc. - Evaluate information o Authority (who created it?) o Accuracy (are the facts substantiated?) o Currency (is it up-to-date/still relevant?) o Objectivity (any bias?) o Coverage (how well does it cover the topic?) - Evaluate websites: Criteria o Affiliation (e.g. who supports the Web site?) o Audience (e.g. level at which it is written/who is it intended for?) o Authority (e.g. who is the author and what are his/her credentials?) o Content (e.g. organisation of content and working links) o Currency (e.g. is the information on the Web page up-to-date?) o Design (e.g. is it easy to navigate and visually pleasing? How quickly does it download?) o Objectivity (e.g. does it reflect any preconceptions?)	
Assessment (PoA): 1 test + 1 examination (1 practical paper + 1 theory paper)	
Reporting: Add raw marks and totals and convert to % for term mark	

CONTENT: (Grade 11 / Term 3)	NOTES
Systems Technologies: Software **(Practical and theory) (±½ week / 2 hours)** • The role of application software • Function/purpose/role of different types: Multimedia and communication software • Compatibility issues • Versions, patches and service packs • Updating software • Online/web applications, e.g. Google docs • Software for physically challenged users • Explore web applications: Blogs - Uses - Advantages and disadvantages - Good practices	
Internet Technologies: Internet, WWW and Communications **(Practical and theory) (±1½ weeks / 6 hours)** • Types of digital communications: Voice over Internet Protocol (VoIP), FTP, video conferencing, chat rooms, RSS aggregator - Advantages and disadvantages - Good practices • Overview of online services such as banking, shopping, booking/reservations • Uses of computer communications: social websites - Advantages and disadvantages - Good practices - Examples • Limitations of fixed Internet access • Overview of portable and mobile Internet access (basic concepts - What is it? Where is it used? Examples) - Wi-Fi Hotspots, WiMAX, Bluetooth - Portable and mobile - 3G - Cellular data service o Cell phone as a modem o Browser and e-mail software o Website accessibility	
Systems Technologies: Hardware, Software and Computer Management **(Practical and theory) (±½ week / 2 hours)** • Basic system requirements - Hard disk space, CPU, RAM - What does it mean? - How does it link with software? • Software installation - Portable storage medium - Internet download • Management of files: - File types - Properties - File attributes such as read-only and hidden - Import and export - Search	• System utilities can be done in an integrated manner when hardware and other concepts are taught, e.g. - Install and uninstall when software and hardware is taught - Backup and archive when data protection is taught - Disk scanner, defrag and compression when hard drive capacity is taught - Spyware, adware and firewall when we teach viruses and system security
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content: - Computer and human error and the effects thereof such as accuracy and validity - data input - Data types used, e.g. database	

CONTENT: (Grade 11 / Term 3)	NOTES
- Verification and validation of data, e.g. database - Software bugs - Hardware failure • How ICTs impact on the workplace and employment practices - Mobile offices, virtual office, decentralisation of labour, office automation	
Solution Development: Database **(Practical and theory) (±1½ weeks / 6 hours)** • Reports: - Design basic reports using a wizard • Basic calculations at end of report such as: sum, avg, count, min and max • Page headers and footers (design view) • Report headers and footers • Import/export data	
Solution Development: Spreadsheets **(Practical and theory) (±1 week / 4 hours)** • Import/export data • Help files • Work with sheets: - Move, copy, headings, protect, gridlines, freeze panes, etc. • Use different print options such as print area • Integration techniques within package e.g. linking cells and formulas between sheets	
Solution Development: Word Processing **(Practical and theory) (±1 week / 4 hours)** • Mailings - Mail Merge • Reference - Table of contents - Footnotes - Captions - Citations and Bibliography	
Solution Development: HTML / Web design **(Practical and theory) (± 2 weeks / 8 hours)** • Good website/page design - consider • Use of colour (basic) • HTML links - Link syntax: This is a link - Attributes: target and name • HTML images - Syntax: - Attributes: source and alternate text • HTML lists - Numbered list: - Bulleted list: - List items:	
Information Management and Practical Assessment Task (±1½ week / 6 hours) • Role of spreadsheet and database to process and manipulate data to provide information • Reinforce content, concepts and skills through application packages and PAT	
Assessment: 1 practical test + 1 theory test	
Reporting: Add raw marks and totals and convert to % for term mark	

CONTENT: (Grade 11 / Term 4)	NOTES
Internet Technologies: Communications **(Practical) (±½ week / 2 hours)** • Managing e-mail: - Organise using e-mail folders - Sort by, flag, prioritise - Distribution lists, message rules • Register a web-based e-mail address	
Social Implications **(Theory) (±½ week / 2 hours)** Social issues applicable to the above content • Social engineering tricks - what is it? • Information accuracy - why is it important? • Data protection such as backup • Computer misuse • Protecting oneself when online - Online harassment - Stalking and bullying - Malware and security software - E-commerce and e-banking (e.g. https) • Why anti-virus and anti-spyware programs need to be updated and how they function	
Content using case studies **(Practical and theory) (±½ week / 2 hours)** • Consolidate content, concepts and skills using case studies to: - Identify general hardware configuration of a computer in terms of the processor, memory and hard drive size - Understand computers and their uses - Understand how technology helps one to operate more efficiently, effectively and more accurately - Know how to use computers as tools to access information and to communicate with others around the world - Make better buying decisions - interpret advertisements and make judgements about quality and usefulness when buying equipment and software - Know how to fix ordinary computer problems and deal with challenges that arise with utilising computers - Know how to use the Internet and e-mail - Make informed decisions and choices in selecting communication devices and modes of communications for a given scenario - Know what kind of computer uses benefit and advance work and career path opportunities - Know how to protect oneself against online villains and threats. - Know how to apply digital tools to communicate, gather, analyse, use information and solve problems - Understand technology concepts, systems and operations - Recommend specific hardware/software for a specific scenario	
Solution Development: Word Processing **(Practical and theory) (±½ week / 2 hours)** • Mail Merge - Envelopes and labels • Integration with other packages	
Solution Development: Spreadsheets **(Practical and theory) (±1 week / 4 hours)** • Consolidate and reinforce content, concepts and skills • Templates, e.g. basic invoice and receipt, home/personal budget, basic time sheet • Plan and design own documents for specific scenarios and inquiries • Integration with other packages • Problem solving using spreadsheets • Troubleshooting spreadsheets	

CONTENT: (Grade 11 / Term 4)	NOTES
Solution Development: Database **(Practical and theory) (±1 week / 4 hours)** • Formatting techniques to fields, records, tables, forms, queries and reports • Integration with other packages • Design a database table for a specific scenario, including forms, queries and reports • Problem solving using databases • Troubleshooting databases	
Solution Development: Documents **(Practical and theory) (Word processor, spreadsheet, presentations, database)** **(±1 week / 4 hours)** • Use integrated software effectively and efficiently to reproduce and create documents that incorporate text, graphics and data • Manipulate graphics and text within documents. • Use integrated software to create and design documents for specific purposes • Apply general principles of layout and design to a document process • Emphasise information using techniques such as placement and colour • Create documents by customising templates • Use media, visual literacy and technology skills to create products that express understanding	Learners should apply a combination of techniques, knowledge and skills learned to new situations in order to complete a task/solve a problem or achieve an objective. Learners should complete integrated practical tasks that encourage thinking and decision - making.
Information Management and Practical Assessment Task **(Practical) (±2 weeks / 8 hours)** • Reinforce content, concepts and skills in finalising PAT • Finalise PAT	
Assessment (PoA): Practical Assessment Task + 1 examination (1 practical paper + 1 theory paper 1)	
Promotion mark: Convert term marks to 25%, convert PAT mark to 25%, convert paper 1 to 25%, convert paper 2 to 25%	

GRADE 12

CONTENT: (Grade 12 / Term 1)	NOTES
Systems Technologies: General Concepts **(Theory) (±½ week/ 2 hours)** • Types of computer systems for different uses: - Personal, SOHO, mobile and power users • Role and use of data, information, knowledge, conclusion/decision as part of information management • Reasons for using computers: - saving paper, time, labour - communication costs - efficiency - accuracy - reliability - effect on time and distance - global communication including social networks and web tools such as blogs, wikis, etc. • Convergence - What is it?	
Systems Technologies: Hardware **(Theory) (±1½ weeks /6 hours)** • Input, output, processing, storage and communication as part of the information processing cycle • Consolidate and reinforce hardware and software regarding uses, advantages and limitations of common/generic input, output, storage and communication devices • Integration of input modes to enhance productivity/efficiency • Making buying decisions: - What to buy? / Why? / Fit for purpose • Keyboard and mouse: - Ergonomic considerations - Wireless vs cables • Digital cameras, web cams, scanners, monitors: uses, advantages and limitations - Resolution and image quality - Software to use with these such as OCR • Voice recognition - uses, advantages and limitations • Printers - Which printer is best for task? Why? - Budget, speed, colour, cost per page, graphics capability, photo printing, paper type and size, system compatibility, future needs, wireless capability, mobility, fit for purpose - Resolution, economical and environmental considerations • Storage: - Capacity, volatility, durability, backup, fit for purpose • Processing: - Making informed decisions regarding the basic components of the system unit e.g. buying a system that will be suitable for running particular software (system requirements) regarding processor and RAM - Interpret specifications regarding CPU and RAM (basic) • Productivity, efficiency, accuracy, accessibility issues • Risks associated with input devices such as key logging software • Suggest input, output, storage, communication devices as well as CPU and RAM including specifying basic specifications in terms of processor, memory and storage for: - home user - SOHO user - mobile user - power user - disabled user • Fix ordinary problems such as: - sticky mouse - scanning - disk errors, e.g. defragging - resolution - non-responding programs - printing problems - checking amount of used or free space on storage medium • New technology - their uses and merit	

<table>
<tr><th>CONTENT: (Grade 12 / Term 1)</th><th>NOTES</th></tr>
<tr><td colspan="2">Systems Technologies: Software
(Theory) (±½ week / 2 hours)
• Software that enhances accessibility, efficiency, productivity such as:
- Voice recognition software
- Typing tutor/keyboarding skills
- Note-taking software
• Uses of common applications such as:
- Applications dealt with practically (word processing, spreadsheet, database, presentation)
- Reference software
- E-mail software
- Document management software such as PDF file formats
- Web browsers
• Web-based applications vs installed applications
- Advantages, disadvantages, examples and what they offer
• Interpret system requirements and compare to system properties such as hard disk space, memory, and processor
• Common software problems and upgrades such as:
- Obtaining and installing software improvements (patches), updates
- Read-only files, etc.
• Risks of using flawed software
• Which software to use where and when and by whom</td></tr>
<tr><td colspan="2">Social Implications
(Theory) (±½ week/ 2 hours)
• Social issues applicable to the above content:
- environmental issues
- user-centered design in software applications such as:
o website
o database form
o presentations</td></tr>
<tr><td>Solution Development: Database
(Practical and theory) (± 2½ weeks / 10 hours)
• Reinforce content, concepts and skills from Grade 11
• Design reports - grouped
• Group headers and footers
• Calculations in groups such as sum, average, counting, maximum, minimum
• Add fields with calculations in queries, reports
• Data validation techniques
• Queries using and, or, not, wildcards(*), IS Null operator</td><td rowspan="2">Learners should solve problems, i.e. apply a combination of techniques, knowledge and skills learned to new situations.
Teach learners to use and combine information, data and ideas to solve the problems to discover and explain relationships or trends and predict behaviour/events,
Tasks given to learners should also involve procedural skills and encourage computational thinking.</td></tr>
<tr><td>Solution Development: Spreadsheet
(Practical and theory) (±2 weeks / 8 hours)
• Reinforce content, concepts and skills
• More complex functions such as:
- Nested IF
- Vertical lookup, including error indicator #N/A
- Variations of known functions, e.g. rounding up and rounding down
• Basic date and time calculations</td></tr>
</table>

CONTENT: (Grade 12 / Term 1)	NOTES
Solution Development: Word Processing **(Practical and theory) (±1½ week/ 6 hours)** • Bookmarks • Reviewing and tracking changes • Line breaks (pagination issues such as widow/orphan control) • Import data collected via electronic forms	
Information Management and Practical Assessment Task **(Practical) (±1 week / 4 hours)** • Reinforce content, concepts and skills from Grade 10 and Grade 11 • Setting questionnaires • Gather information and data • Discuss the writing of professional/formal reports • Discuss the use of spreadsheet and database in professional reports	
Assessment (PoA): 1 practical test + 1 theory test	
Reporting: Add raw marks and totals and convert to % for term mark	

CONTENT: (Grade 12 / Term 2)	NOTES
Network Technologies: Networks **(Theory) (±1 week / 4 hours)** • Wide area networks (WAN) - Definition, purpose and role • Internet as an example of a WAN • Internet services (uses/purpose, advantages, disadvantages, limitations, examples): - Real-time messaging - instant messaging and chat - Voice over Internet Protocol (VoIP) - File Transfer Protocol (FTP) - File sharing - Concept of grid computing and cloud computing • Government Internet services and information such as tax return, TV licence payment and election information • Make buying and informed decisions regarding Internet connection and access - Modem/router, types of connections, e.g. ADSL, wireless technologies, including their advantages, disadvantages and limitations - ISP, Internet services - Consideration of access points, coverage (wireless) - Data transmission speed - measured in kilobits per second(kbps) and megabits per second (mbps) - CAP, bundle • Concept of broadband and bandwidth • Downloading/uploading	
Social Implications **(Theory) (±½ week / 2 hours)** • Social issues applicable to the above content: - Computer crimes in relation to hardware, software, information, identity, bandwidth theft, theft of time and services - Internet-related fraud scams - Internet attacks - Taking over PCs, e.g. bots, zombies - Right to access vs right to privacy - Misuse of personal information • Security issues such as malware, spyware, adware, pop-ups, key logging and safe guards such as firewalls • Avoiding security threats • Safeguards against criminals, viruses and threats • The impact of technology on the global community: Distributed computing power	
Solution Development: HTML/Web Design **(Practical and Theory)(± 1½ weeks / 6 hours)** • Reinforce content, concepts and skills as well as good website/page design • HTML tables - Syntax: Table tags • Attributes: border, cell padding • Develop a web page for a specific scenario	
Solution Development: Spreadsheets (practical and theory) (±1½ week / 6 hours) • Reinforce and consolidate content, concepts and skills • Text functions such as: - left, right, mid, concatenate, len, value and find	
Solution Development: Word Processing (practical and theory) (± 1 week / 4 hours) • Reinforce and consolidate content, concepts and skills • Mail Merge - different data sources, e.g. e-mail list • File management: Prepare, publish	

CONTENT: (Grade 12 / Term 2)	NOTES
Solution Development: Database (± ½ week / 2 hours) • Reinforce and consolidate content, concepts and skills • Design a database for a specific scenario	
Information Management and Practical Assessment Task (± 2 weeks / 8 hours) • Practical Assessment Task - Reinforce Information Management skills - Use information and data gathered: Processing and analysing	
Assessment (PoA): 1 test + 1 examination (1 practical paper + 1 theory paper)	
Reporting: Add raw marks and totals and convert to % for term mark	

CONTENT: (Grade 12 / Term 3)	NOTES
Systems Technologies: System Software and Computer Management **(Theory) (±1 weeks / 4 hours)** • Role of the operating system: - Starting the computer - Provide user interface - Manage programs o Concept of single user vs multiple users including examples o Concept of multitasking including examples o Concept of Task Manager (Windows) • Management of files: File types, properties, file attributes such as read-only and hidden as well as metadata such as the author and title properties of documents, import, export, search and conversion • Operating system utilities (what is it? why is it needed?): - File management - Schedule/update - Coordinate tasks - Concept of spooling when printing - Compress/decompress files and folders - Security features such as access control, control of spyware, adware and firewall - Backup • Anti-virus software • General troubleshooting using utility software - e.g. defragmentation • Factors that influence performance such as: - RAM - Type of processor, processor speed - Number of applications running and caching - Hard disk space/fragmentation - Influence of malware - Basic concepts/non-technical	
Internet Technologies: Communications **(Practical and theory) (±1 week / 4 hours)** • Types of digital communications such as video conferencing: - Advantages and disadvantages - Good practices • Typical features of web browsers such as: - Bookmarks - History and favourites - Home page settings - Pop-up blocker - Blocking websites - Caching - Browser plug-ins - What are they? Why are they needed? Examples • Uses of computer communications such as: - RSS feeds - Blogs/vlogs - Podcast/vodcast - Wikis - GPS - Social networks • Digital communications: - Strengths and weaknesses - Advantages, disadvantages and limitations - Good practices • Communication devices: Smart phones and other personal mobile devices • New trends and technologies	• Practical: E-mail - calendar, contacts, tasks, archive • Blogging: Register blog space, publish blog through WP • Creating a profile on Facebook

CONTENT: (Grade 12 / Term 3)	NOTES
Social Implications **(Practical and theory) (±½ week / 2 hours)** • Social issues applicable to the above content: - Impact and use of social networking sites and technologies such as: o MySpace o Facebook o Twitter o Virtual communities such as Second Life • The impact of technology on the global community - Tele-commuting/tele-working - Computer fraud • How technology can benefit or harm society • Use information sources from around the world • Information overload	
Solution Development: Spreadsheets **(Practical and theory) (±1 week / 4 hours)** • Consolidate and reinforce content, concepts and skills • Identify appropriate functions to suit scenario and solve problem: - Date and time, maths, statistical, text, logical, lookup and reference • Use more advanced combinations of functions and formulas • Edit, format and change charts including - Changing the scale on the axes - Minimum and maximum values - Re-labelling axes, etc. - Creating stacked bar and column graphs using a graphic, etc. • Appropriate graph for a given scenario	
Solution Development: Word Processing **(Practical and theory) (±½ week / 2 hours)** • Consolidate and reinforce content, concepts and skills • Documents using style focusing on aspects such as: - Page layout that includes advanced word processing techniques - Techniques of integration with other software including linking objects	
Solution Development: Database **(Practical and theory) (±½ week / 2 hours)** • Consolidate and reinforce content, concepts and skills • Create a database for a given scenarios	
Solution Development: HTML/Web Design **(Practical and Theory)(± ½ week / 2 hours)** • Reinforce content, concepts and skills as well as good website/page design	
Information Management **(Practical) (± 2 weeks / 8 hours)** • Practical Assessment Task - Reinforce Information Management skills - Use information and data gathered: Processing and analysing	
Assessment (PoA): 1 test + 1 examination (1 practical paper + 1 theory paper)	
Reporting: Add raw marks and totals and convert to % for term mark	

CONTENT: (Grade 12 / Term 4)	NOTES
Documents (Word processor, spreadsheet, presentations, database) **(Practical and theory) (±1½ weeks / 6 hours)** Consolidate content, concepts and skills to develop a software solution • Use integrated software effectively and efficiently to reproduce and create documents that incorporate text, graphics and data • Manipu late graphics and text within documents. • Use integrated software to create and design documents for specific purposes • Apply general principles of layout and design to a document process • Emphasise information using techniques such as placement and colour • Create documents by customising templates • Use media, visual literacy and technology skills to create products that express understanding	
Consolidation of content using case studies - All Topics **(Practical and theory) (±1½ weeks / 6 hours)** • Consolidate content, concepts and skills using case studies to: - Identify general hardware configuration of a computer in terms of: o the processor o memory o hard drive size - Understand computers and their uses - Know how to use computers as tools to access information and to communicate with others around the world - Make better buying decisions: o interpret advertisements and make judgements about quality and usefulness when buying equipment and software - Know how to fix ordinary computer problems and deal with challenges that arise from utilising computers - Know how to use the Internet and e-mail - Know how to use application packages and when to use which one - Make informed decisions and choices in selecting communication devices and modes of communications for a given scenario - Know what kind of computer uses benefit and advance work and career path opportunities - Know how to protect oneself against online villains and threats - Know how to apply digital tools to: o Communicate o Gather o Analyse o Use information o Solve problems - Understand technology concepts, systems and operations and how it operates efficiently, effectively and accurately - Recommend specific hardware/software for a specific scenario - Know about upgrading and how to integrate equipment with new products/technology - Understand when to upgrade, when to buy new equipment or software and make informed decisions	
External examination (±7 weeks / 24 hours)	
• **Practical examination**	**25%**
• **Theory examination**	**25%**
External examination: **1 practical paper + 1 theory paper** **Plus** **Practical Assessment Task**	
SBA Mark: Add raw marks and totals for assessment tasks from term 1 to term 3 and convert to 25%	

SECTION 4

ASSESSMENT IN COMPUTER APPLICATIONS TECHNOLOGY

4.1 Introduction

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching.

Assessment involves activities that are undertaken throughout the year. In grades 10-12 assessment comprises 2 different but related activities: informal daily assessment (assessment for learning) and formal assessment (assessment of learning).

Assessment in CAT should encourage computational thinking practices, that is integrating the power of human thinking with the capabilities of ICTs and application packages.

4.2 Informal or daily assessment

Assessment for learning has the purpose of continuously collecting information on a learner's achievement that can be used to improve their learning.

Informal assessment is the daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can mark these assessment tasks.

Self-assessment and peer assessment actively involves learners in assessment. This is important as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. The results of daily assessment tasks are not used for promotion and certification purposes.

4.3 Formal assessment

All assessment tasks that make up a formal programme of assessment for the year are regarded as formal assessment. Formal assessment tasks are marked and formally recorded by the teacher for progression and certification purposes. All formal assessment tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained.

Formal assessment provides teachers with a systematic way of evaluating how well learners are progressing in a grade and in a particular subject. Examples of formal assessments include tests, examinations, practical tasks, projects, etc. Formal assessment tasks form part of a year-long formal programme of assessment in each grade and subject.

The following tables provide the formal assessment requirements for Computer Applications Technology:

Grade 10 and 11

Formal Assessment			
During the Year	**End-of-Year Examination**		
25%	**75%**		
SBA tasks	**Practical Assessment Task**	**End-of-Year Exam Papers (50%)**	
25%	**25%**	**25%**	**25%**
• 5 tests • 1 exam (mid-year)	**Project** Information management project based on providing a solution to a specific scenario by using the applications as indicated under Solution Development	**Written exam** 2-3 hours Theory aspects of all content, concepts and skills of all topics	**Practical exam** 3 hours Solution Development

Grade 12

Formal Assessment			
During the Year	**End-of-Year Examination**		
25%	**75%**		
SBA	**Practical Assessment Task**	**End-of-Year Exam Papers (50%)**	
25%	**25%**	**25%**	**25%**
• 4 tests • 2 exams (mid-year and trial)	**Project** Information management project based on providing a solution to a specific scenario by using the applications as indicated under Solution Development	**Written exam** 3 hours Theory aspects of all content, concepts and skills of all topics	**Practical exam** 3 hours Solution Development

The forms of assessment used should be age and developmental level appropriate. The design of these tasks should cover the content of the subject and include a variety of tasks designed to achieve the objectives of the subject.

4.3.1 Types of formal assessment for Computer Applications Technology

Project

A project assesses the learner's ability to apply knowledge, skills and a range of competencies in an integrated manner, many of which cannot be assessed in other ways. It has a degree of open-endedness, but is focused and results in individual but similar tasks. The time to complete a project ranges from a few days to several weeks.

In CAT the project is the practical assessment task (PAT)

The project should enable a learner to apply a combination of techniques, knowledge and skills to new situations to complete the task or accomplish a goal. It should also encourage learners to use and combine information, data and ideas to solve problems, discover and explain relationships or trends and predict behaviour/events.

A project should require the learner to

- do some planning/preparation/investigation/research/data gathering to solve the identified problem/task;

- perform the task/carry out instructions (according to criteria given);
- produce a product such as a report with introduction, main body, conclusion and recommendations/solutions (this could include a limited number of smaller products such as a planning document, that builds up to the final product, which the teacher could monitor or assess informally or formally);
- demonstrate thinking and decision making skills; and
- demonstrate some innovation and creativity.

To set and manage the project, the teacher should:

- determine the content/skills/knowledge to be addressed;
- set clear criteria and give clear instructions to guide the learner (the learner should know exactly what to do and what is expected);
- keep the scope manageable;
- determine which resources will be required to complete the project and ensure that learners have access to these resources;
- determine the time frame/duration/due date;
- determine mark distribution and compile an assessment tool; and
- continuously monitor the completion of the project and guide the learners.

Tests

A test could be a practical test or a written test. The programme of assessment should reflect a balance between practical and written tests. Tests could include open book tests.

- A test for formal assessment should not comprise of a series of small tests, but should cover a substantial amount of content and the duration should be 45 to 60 minutes.
- Open book tests require learners to find information and apply knowledge and skills. Learners are tested on understanding and application of learning material and not on rewriting text from sources. Open book tests should not include only short questions. They must include questions/tasks that will encourage thinking and decision making.

  For written open book tests, learners are required to write longer reflective answers, such as paragraph-type responses to a given scenario, e.g. case studies. Paragraphs providing reasons and supporting evidence/ arguments are essential.

  For practical open book tests learners are required to apply a combination of a series of procedures and techniques to new situations in order to provide a specific answer or accomplish a specific goal, e.g. integrated practical tasks that encourage computational thinking.
- Each test, open book test and examination must reflect different cognitive levels.

Formal assessments must cater for a range of cognitive levels and abilities of learners as shown in the table below:

Lower order *(Knowledge/remembering)* *(Routine procedures)*	**Middle order** *(Understanding/applying)* *(Multi-step procedures)*	**Higher order** *(Analysing/evaluating/creating)* *(Problem solving)*
30%	40%	30%

4.4 Programme of assessment

The following tables provide the programme of assessment requirements for each term for Computer Applications Technology:

Grade 10 and 11

Programme of Assessment			
SBA per Term			
Term 1: 1 practical test + 1 theory test	**Term 2:** 1 test + 1 examination comprising 2 papers: 1 theory + 1 practical	**Term 3:** 1 practical test + 1 theory test	**Term 4:** 1 examination comprising 2 papers: 1 theory + 1 practical Plus PAT
		Practical Assessment Task (PAT)	
Term Mark (Terms 1 - 3): • Each term, add raw marks and totals and convert to % for term mark ***Promotion Mark:*** • Add raw marks and totals for assessment tasks from term 1 to term 3 and convert to 25% • Convert PAT mark to 25% • Convert paper 1 to 25% • Convert paper 2 to 25%			

Grade 12

Programme of Assessment			**External Assessment**
SBA per Term			
Term 1: 1 practical test + 1 theory test	**Term 2:** 1 test + 1 examination comprising 2 papers: 1 theory + 1 practical	**Term 3:** 1 test + 1 examination comprising 2 papers: 1 theory + 1 practical	**Term 4:** 1 external examination comprising 2 papers: 1 theory + 1 practical Plus Practical Assessment Task
Practical Assessment Task (PAT)			
Term Mark (Terms 1 - 3): • Each term, add raw marks and totals and convert to % for term mark ***SBA Mark:*** • Add raw marks and totals for assessment tasks from term 1 to term 3 and convert to 25% ***External Examination:*** • Convert paper 1 to 25% • Convert paper 2 to 25% • Convert PAT to 25%			

4.4.1 Examinations

Practical Assessment Task (25% of the total marks for the subject)

The Practical Assessment Task is a project that assesses the learner's procedural skills and individual interaction with data and information as well as the way in which he or she processes, manipulates and presents the information. The information will finally be presented in a number of documents. These must be presented in the four application programs studied.

The CAT PAT focuses on Information Management and the use of ICTs and application software. It covers the following:

- Identifying, finding and accessing information/data;
- Using, manipulating and processing information and data gathered; and
- Presentation of solutions/findings/recommendations.

Evidence of the process must be provided in a series of draft documents.

Each task must include a declaration of authenticity.

In Computer Applications Technology the PAT counts 25% of the total promotion/certification mark for the subject. It is implemented across the school year and should be undertaken as one extended task, which is broken down into different phases.

In Grade 12, the criteria for the Practical Assessment Task are externally set, internally administered and marked and externally moderated.

The topic of the PAT will be provided to schools each year by the end of the previous year.

Paper 1: One 3-hour practical paper of 180 marks (25% of the total marks for the subject)

This will be a practically oriented paper covering questions on Solution Development.

To successfully complete this paper, each learner must have access to his or her own computer in the exam room. Provision needs to be made for sufficient computers to enable the examination to be completed in **two sittings**.

This paper assesses the practical skills pertaining to Solution Development, that is the application packages studied, namely word processing, spreadsheets and databases as well as creating a simple web page using HTML. Presentations will only be assessed in the Practical Assessment Task and NOT in the examinations. These skills will be assessed in an integrated manner based on real-life scenarios. Problem solving and aspects of file management will form part of the assessment of the application questions in this paper.

The paper will comprise of questions based on a scenario and will cover the following content areas in an integrated manner:

- Word processing (± 50 marks)
- Spreadsheets (± 50 marks)
- Databases (± 40 marks)

- Web development (± 20 marks)
- General (integration and application of techniques, knowledge and procedural skills to new situations) (± 20 marks)

An information sheet with HTML tags will be provided for use with the question on web development.

The learner will not be required to enter large amounts of data. The required data could be retrieved from the data disk or imported from documents such as a text file, word processing document, a database table or a spreadsheet.

Paper 2: One 3-hour written paper of 150 marks (25% of the total marks for the subject)

The paper will cover all theory aspects of all topics, including elements of Solution Development (viz. application packages and file management). A section will also assess the understanding of the technologies studied to make informed decisions in a real - life end - user scenario, ranging from choices of technology to its responsible use.

The table below gives a breakdown of the structure of the question paper:

Section	Description
A	• **Short questions (± 25 marks)** A range of short questions covering all topics that could include: - Multiple choice, - Modified true and false, and - Matching columns.
B	• **Question 3: Systems Technologies (± 25 marks)** Questions related to the content, concepts and skills in the systems technologies topic area.
	• **Question 4: Internet and Network Technologies (± 15 marks)** Questions related to the content, concepts and skills in the Internet and WWW, e-communication and network technology topic areas.
	• **Question 5: Information Management (± 10 marks)** Questions related to the management of information.
	• **Question 6: Social Implications (± 10 marks)** Questions are focused on the content, concepts and skills in the social implications focus area, namely impact of ICTs on society and health, social, legal, ethical, security and environmental issues.
	• **Question 7: Solution development (± 15 marks)** Questions focused on the solution development topic area, namely the knowledge and understanding that supports the practical application of skills.
C	• **Question 8: Integrated Scenario (± 50 marks)** This section is based on a single scenario and will be aligned to all the topics. This section will also assess the understanding of these technologies to make informed decisions in a real-life end-user scenario, ranging from choices of technology to its responsible use.

Content to be covered

Assessment addresses the content as set out in this document. Due to the conceptual progression of the content across the grades, content and skills from Grade 10-12 will be assessed in the external papers at the end of Grade 12.

A list of emerging technologies to be covered for examination purposes will be provided each year to schools by the end of the previous year.

4.5 Recording and reporting

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge as prescribed in the curriculum and assessment policy statements. Records of learner performance should provide evidence of the learner's conceptual progression within a grade and her/his readiness to progress or promoted to the next grade. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process.

Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitations, parent-teacher conferences, phone calls, letters, class or school newsletters, etc. Teachers in all grades report in percentages against the subject.

Seven levels of competence have been described for each subject listed for Grades R-12. The various achievement levels and their corresponding percentage bands are as shown in the table below:

Codes and percentages for recording and reporting

Rating Code	Description of Competence	Percentage
7	Outstanding achievement	80 - 100
6	Meritorious achievement	70 - 79
5	Substantial achievement	60 - 69
4	Adequate achievement	50 - 59
3	Moderate achievement	40 - 49
2	Elementary achievement	30 - 39
1	Not achieved	0 - 29

Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

4.6 Moderation of assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments.

4.6.1 Formal assessment (SBA)

- Grade 10 and 11 tests and examinations are internally moderated. The subject advisor must moderate a sample of these tasks during his/her school visits to verify the standard of tasks and the internal moderation
- Grade 12 tests and examinations must be moderated at provincial level. This process will be managed by the provincial education department.
- Subject advisors must moderate samples of tests and examination papers before they are written by learners to verify standards and guide teachers on the setting of these tasks.

4.6.2 Practical Assessment Task (PAT)

- Grade 10 and 11: Teachers assess the practical assessment tasks in grade 10 and 11. The subject advisor must moderate a sample of PATs during his/her school visits to verify the standard of tasks and the internal moderation
- Grade 12: Teachers assess the practical assessment tasks according to the externally set assessment tool. The subject advisor must moderate a sample of each phase of the PATs during his/her school visits to verify the interpretation of the assessment tool and the standard of marking. Completed PATs must also be moderated at provincial level. This process will be managed by the provincial education department.

4.7 Annexures

Annexure A - Glossary of acronyms and abbreviations.

4.8 General

This document should be read in conjunction with:

4.8.1 *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*; and

4.8.2 The policy document, *National Protocol for Assessment Grades R-12.*

ANNEXURE A

Glossary of Acronyms and Abbreviations

3G	Third generation of cellular wireless
ADSL	Asymmetric Digital Subscriber Line
ATM	Automated Teller Machine
CD	Compact Disk
BIOS	Basic Input Output System
CPU	Central Processing Unit
DLP	Digital Light Processor
DVD	Digital Versatile Disk
EFT	Electronic Funds Transfer
FOSS	Free Open Source Software
FTP	File Transfer Protocol
GIGO	Garbage-In Garbage-Out
GPS	Global Positioning System
GUI	Graphical User Interface
HAN	Home Area Network
HCI	Human Computer Interface
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
I/O	Input-Output
ICT	Information and Communication Technology
IP	Internet Protocol
ISP	Internet Service Provider
LAN	Local Area Network
LCD	Liquid Crystal Display
MICR	Magnetic Ink Character Recognition
MMS	Multimedia Message Service
NIC	Network Interface Card
OCR	Optical Character Recognition
OMR	Optical Mark Recognition
OS	Operating System
PAN	Personal Area Network
PAT	Practical Assessment Task
PC	Personal Computer
PDA	Personal Digital Assistant
PnP	Plug-and-Play

PoA	Programme of Assessment
POS	Point of Sales
RAM	Random Access Memory
RFID	Radio-Frequency Identification
ROM	Read Only Memory
RSI	Repetitive Strain Injury
RSS	Really Simple Syndication
SMS	Short Message System
SOHO	Small Office Home Office
URL	Uniform Resource Locater
USB	Universal Serial Bus
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
WAN	Wide Area Network
Wi-Fi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access
WWW	World Wide Web
WYSIWIG	What You See Is What You Get