

Introduction to Information and Communication Technology

Leaving Certificate Applied

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NCCA
An Chomhairle Náisiúnta Curaclaim agus Measúnachta
National Council for Curriculum and Assessment



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INTRODUCTION

SENIOR CYCLE

Senior cycle students are approaching the end of their time in school and are focusing on the directions they would like to take in their future lives. Senior cycle plays a vital role in helping students to address their current needs as young adults and in preparing them for life in a changing economic and social context.

Senior cycle is founded on a commitment to educational achievement of the highest standard for all students, commensurate with their individual abilities. To support students as they shape their own future there is an emphasis on the development of knowledge and deep understanding; on students taking responsibility for their own learning; on the acquisition of key skills; and on the processes of learning. The broad curriculum, with some opportunities for specialisation, supports continuity from junior cycle and sets out to meet the needs of students, some of whom have special educational needs, but who all share a wide range of learning interests, aptitudes and talents. The curriculum at senior cycle promotes a balance between knowledge and skills, and the kinds of learning strategies relevant to participation in, and contribution to, a changing world where the future is uncertain.

Assessment in senior cycle involves gathering, interpreting and using information about the processes and outcomes of learning. It takes different forms and is used for a variety of purposes. It is used to determine the appropriate route for students through a differentiated curriculum, to identify specific areas of difficulty or strength for a given student and to test and certify achievement. Assessment supports and improves learning by helping students and teachers to identify next steps in the teaching and learning process.

THE EXPERIENCE OF SENIOR CYCLE

The vision of senior cycle sees the learner at the centre of the educational experience. That experience will enable students to be resourceful, to be confident, to participate actively in society, to build an interest in learning, and to develop an ability to learn throughout their lives.

This vision of the learner is underpinned by the values on which senior cycle is based and it is realised through the principles that inform the curriculum as it is experienced by students in schools. The

module descriptor has embedded key skills, clearly expressed learning outcomes, and is supported by a range of approaches to assessment; it is the vehicle through which the vision becomes a reality for the learner.

At a practical level, the provision of a high-quality educational experience in senior cycle is supported by:

- Effective curriculum planning, development, organisation and evaluation
- Teaching and learning approaches that motivate and interest students, that enable them to progress, that deepen and apply their learning, and that develop their capacity to reflect on their learning
- Professional development for teachers and school management that enables them to lead curriculum development and change in their schools
- A school culture that respects students, that encourages them to take responsibility for their own learning over time, and that promotes a love of learning.

Senior cycle education is situated in the context of a broader education policy that focuses on the contribution that education can make to the development of the learner as a person and as a citizen. It is an education policy that emphasises the promotion of social cohesion, the growth of society and the economy, and the principle of sustainability in all aspects of development.

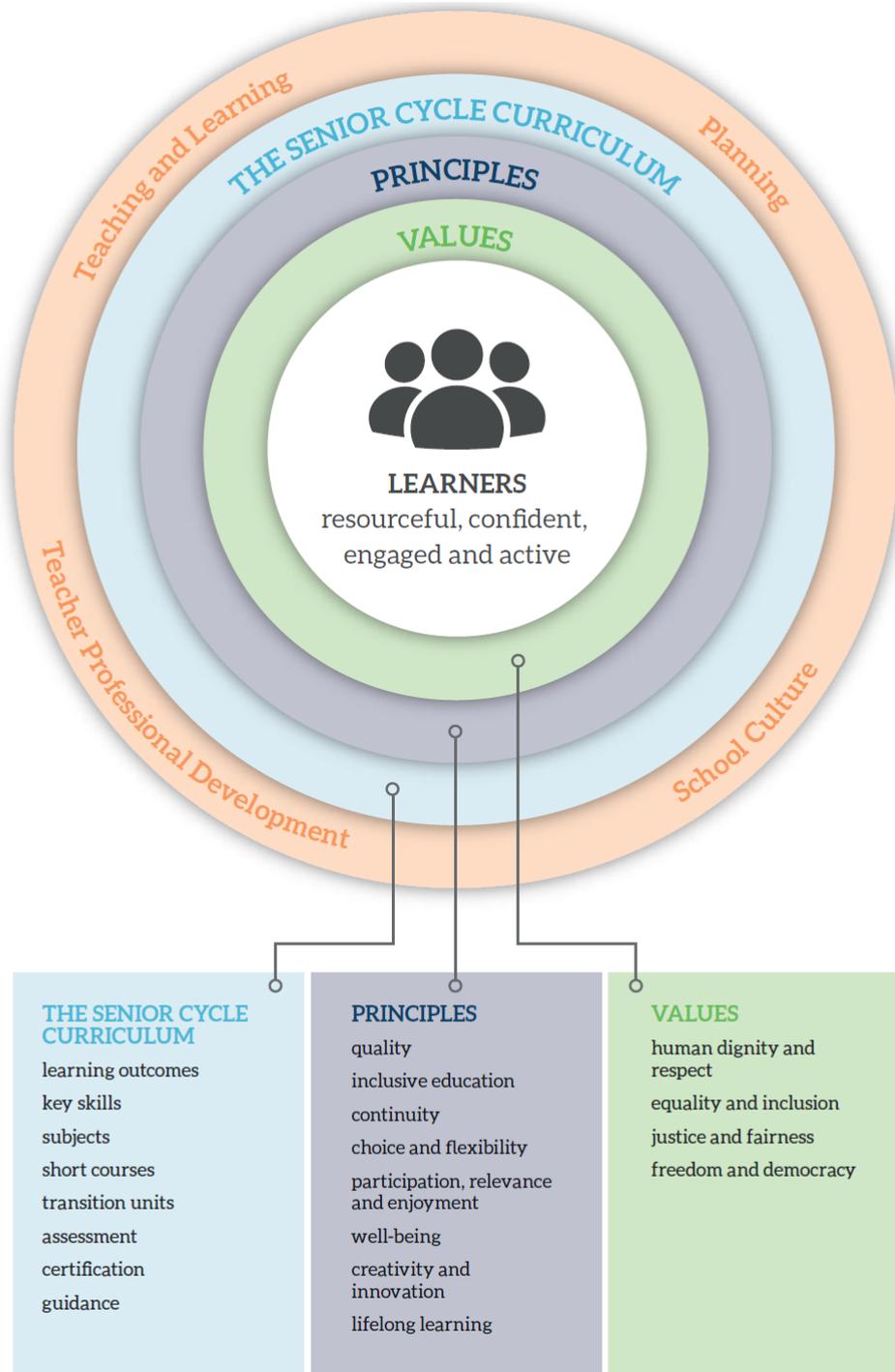


Figure 1: Principles and values of the senior cycle curriculum



Figure 2: Learners in senior cycle

RELATED LEARNING

The Leaving Certificate Applied Introduction to ICT module builds on the knowledge, attitudes and broad range of transferable skills that stem from the student's educational experience at early childhood, primary and post-primary junior cycle.

Early childhood

Aistear, the early childhood curriculum framework, celebrates early childhood as a time of wellbeing and enjoyment where children learn from experiences as they unfold. The theme of Exploring and thinking is about children making sense of the things, places and people in their world by interacting with others, playing, investigating, questioning, and forming, testing and refining ideas. The theme of Communicating is about children sharing their experiences, thoughts, ideas, and feelings with others with growing confidence and competence, in a variety of ways and for a variety of purposes.

Primary school

The curriculum area of Social, Environmental and Scientific Education (SESE) at primary school provides opportunities for children to actively explore and investigate the world around them from a human, social and cultural perspective. A scientific approach to investigations fosters the development of important skills, concepts and knowledge through which children can observe, question, investigate, understand and think logically about living things and their environments, materials, forces, everyday events and problems. The knowledge and skills acquired may be applied in designing and making activities in which children perceive a need to create or modify elements of their environments. Through their investigations, children develop informed, critical and scientific perspectives that acknowledge the importance of founding judgements on a respect for facts, accuracy and reason.

ICT builds on language skills developed at primary level. Through language, students learn to use appropriate sequencing, tenses and vocabulary to tell and retell stories and personal and procedural narratives of increasing complexity. They learn to use topic-specific language to give information, to explain and to justify their ideas and to predict and reflect upon actions, events and processes relating to real and imaginary contexts. Language skills developed at primary level will help students of ICT to appreciate the importance of the correct use of language and just how powerful words and language are in the context of social media.

Junior cycle

Many of the Statements of Learning at junior cycle relate to ICT in the Leaving Certificate Applied (LCA), especially those statements focused on problem solving, design, communication, and understanding the role and contribution of technology in society. In addition, the key skills required for successful learning by students across the curriculum at junior cycle are relevant for ICT in the LCA. Many junior cycle subjects and short courses have close links with ICT particularly mathematics, science, CSPE, and the short courses in coding and digital media literacy.

Senior cycle

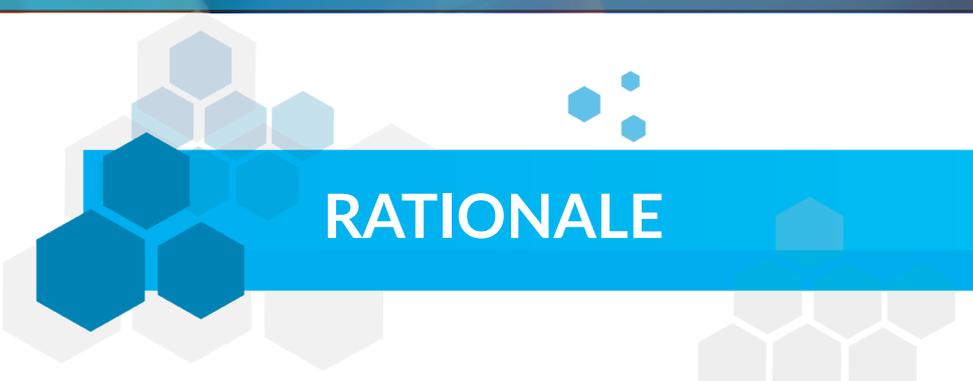
ICT in the LCA is inherently a transdisciplinary subject, authentic and relevant to the real world. Transdisciplinary learning is not confined by traditional subjects but is supported and enriched by them. The knowledge and learning gained in LCA ICT can be enhanced and utilised across the LCA programme by enriching the tasks, learning and Key Assignments in other subject areas. In this way, students will appreciate the power of ICT to represent complex situations and solutions in many discipline areas as well as in more complex real-life situations they encounter in their lives.

Further study

Students live in a technologically-rich world. ICT in the LCA will afford students opportunities to build on the knowledge and skills that will help them to understand current computer technology and prepare them for emerging technologies. ICT in the LCA incorporates a broad range of transferable and transdisciplinary skills such as problem solving, logical thinking and creative design. It also promotes skills of synthesis, evaluation, communication, time management, organisation, and teamwork. These skills and capabilities provide support for further study and lifelong learning.

Community and society

Many important aspects of life in society are transacted through interaction with ICT. Therefore, the development of competence in this area, particularly in interpreting and critically evaluating information presented in a number of ways, is becoming imperative for developing and maintaining societies based on equality and democracy.



RATIONALE

Information and Communication Technology forms part of the core curriculum for all Leaving Certificate Applied students. It is intended to develop the students' skills, knowledge, attitudes and understanding of Information and Communication Technology to enable them to use digital technology in both their current and future lives. It is also intended to give students the skills and competencies to assess their engagement with future advances in digital technology with a view to maintaining well-being and enhancing self-esteem.

The accelerated expansion of computing technologies and artificial intelligence into our lives means students need to develop digital skills now, more than at any other time. A basic grounding in word-processing skills and how to represent information is highly relevant to almost all aspects of life, and to every career choice. This introduction to digital literacy will give students the opportunity to gain practical Information and Communication Technology skills that are valuable over the course of this programme, particularly in presenting student task work and key assignments, for school life and their future lives.

NUMBER AND SEQUENCE OF MODULES

Both modules to be completed in the sequence are presented below.

Module 1: Introduction to the computer and word processing

Module 2: Introduction to other software packages and applications

DESCRIPTION OF MODULES

Module 1: Introduction to the computer and word processing

- This module introduces students to the basic concepts and functions of computers. In addition, students will be introduced to the foundations of word processing, to the elementary concepts of the internet and email skills.

Module 2: Introduction to other software packages and applications

- This module introduces students to elementary spreadsheet, graphics and presentation packages.

KEY SKILLS

In senior cycle, there are five key skills (Figure 3) identified as central to teaching and learning across the curriculum: information processing; being personally effective; communicating; critical and creative thinking; and working with others.

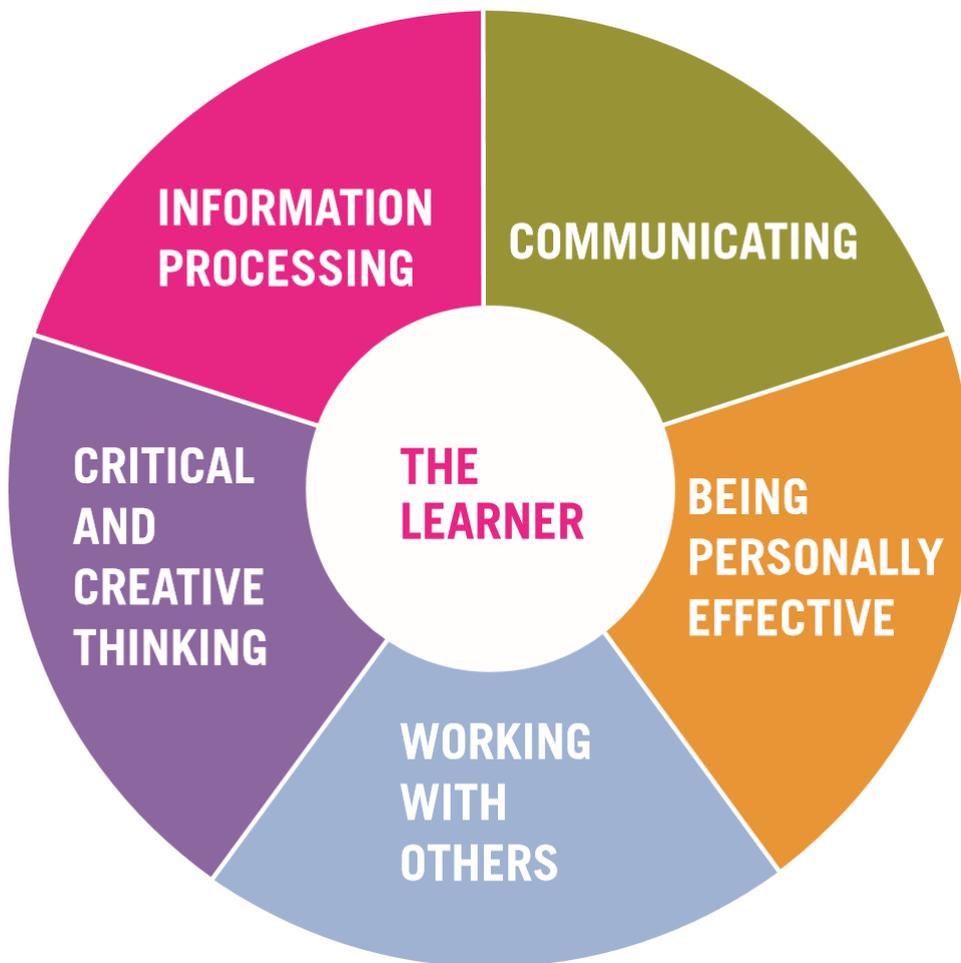


Figure 3: Key skills for senior cycle

The key skills are embedded within the learning outcomes of LCA Introduction to ICT and are assessed in the context of those learning outcomes. This set of key skills, and the learning outcomes associated with them, became the Key Skills Framework (NCCA, 2009). The Key Skills Framework was developed to provide a common, unified approach for embedding the key skills across all future Leaving Certificate specifications. These skills are identified as being important for all students to achieve to the best of their ability, both during their time in school and in the future, and to fully participate in society, in family and community life, the world of work and lifelong learning. LCA Introduction to ICT develops these skills in the following ways:



Information processing

Making sense of ICT through engagement with authentic relevant contexts promotes independent research activities in which students are required to access a wide variety of external materials communicated in a variety of ways. The selection, evaluation, and recording of information are addressed, as students make decisions and judgments based on data and qualitative and quantitative information.

Critical and creative thinking

Applying ICT to real-life contexts requires careful analysis of patterns and relationships, which develops skills of higher-order reasoning and problem solving. Hypothesising, making predictions, examining evidence, and reaching conclusions underpin the core of all the activities proposed in LCA Introduction to ICT.

Communicating

Effective communication skills are developed through collaborative project work. Students communicate face-to-face and through digital media. Although literacy skills are not targeted directly, they are required by students to participate fully in the learning experience. Online research requires and builds analysis and interpretation skills. Students need to read a wide range of information sources. Students are required to express and share their opinions and to hypothesise the reason clearly; debate and argument ensues which encourages engaging in dialogue, listening attentively and eliciting opinions, views and emotions. There are opportunities to develop communication skills further as students compose and present using a variety of media.

Working with others

LCA Introduction to ICT is underpinned by collaboration and working with others. Students gain some appreciation of group dynamics and the social skills needed to engage in collaborative work. This contributes to an appreciation that working collectively can help motivation, release energy, and capitalise on all the talents in a group. One of the most beneficial outcomes of working with others is in identifying, evaluating and achieving collective goals. Students learn to negotiate and resolve differences of opinion as they discuss their different strategies and achieve compromise.

Being personally effective

This key skill contributes to the personal growth of students: they become more self-aware and use this awareness to develop personal goals. An important dimension of this key skill is in building the know-how of students to recognise how to get things done, how to garner and use resources effectively, and how to act autonomously. There is more than one way to answer a problem or set up a problem-solving strategy; there is no golden key to the answer. Students must develop confidence in their self-direction and exhibit tenacity and rigour. To be personally effective, students must build on the metacognitive dimension of knowledge, whereby they develop strategies to learn and to build on previous knowledge.

Teaching and learning

Senior cycle students are encouraged to develop the knowledge, skills, attitudes and values that will enable them to become more independent in their learning and to develop a lifelong commitment to improving their learning.

LCA Introduction to ICT supports the use of a wide range of teaching and learning approaches. The course is experiential in its structure and emphasises the practical application of ICT knowledge to the world around us. As students progress, they will develop problem-solving skills that are transferable across different tasks and different disciplines, enabling them to see the power of ICT.

By engaging in well-structured group discussions, students will develop skills in reasoned argument, listening to each other and reflecting on their own work and that of others.

Engaging with real problems is motivating for students; it allows them to see the relevance of ICT to situations that are important in their lives. The open-ended nature of authentic problems allows students to employ the ICT tools that they prefer as well as practise skills they need to reinforce.

Working towards the Key Assignments and tasks that students engage in will enable them to take charge of their own learning by setting goals, developing action plans, and receiving and responding to assessment feedback. As well as varied teaching strategies, varied assessment strategies will support learning and provide information that can be used as feedback so that teaching and learning activities can be modified in ways that best suit individual students. By setting appropriate and engaging tasks, asking higher-order questions and giving feedback that promotes learner autonomy, assessment will support learning as well as summarising achievement.



DIFFERENTIATION

The LCA Introduction to ICT module descriptor is differentiated to cater for students of differing abilities and levels of achievement.

Differentiation through the learning outcomes

Learning outcomes should be achievable relative to each student's ability level. Learning outcomes promote teaching and learning processes that develop students' knowledge and understanding incrementally, enabling them to analyse, evaluate and apply knowledge to different situations as they progress.

Differentiation in teaching and learning

LCA Introduction to ICT provides numerous opportunities for teachers to teach the subject and select materials that meet the needs and interests of all students. The focus on the experiential approach to teaching and learning, which is central to LCA Introduction to ICT, means that students can be engaged in learning activities that complement their own needs and ways of learning. The content matter of the course is specified in broad terms to allow the selection and exploration of topics in ways that are of most interest and relevance to the students.

Students vary in the amount and type of support they need to be successful. Levels of demand in any learning activity will differ as students bring different ideas and levels of understanding to it. The use of strategies for differentiated learning such as adjusting the level of skills required, varying the amount and the nature of teacher intervention, and varying the pace and sequence of learning will allow students to interact at their own level.

Differentiation in assessment

Assessment of LCA Introduction to ICT will be based on the learning outcomes in the specification.

The Key Assignments provide opportunity for students to display evidence of their learning appropriate to their level.

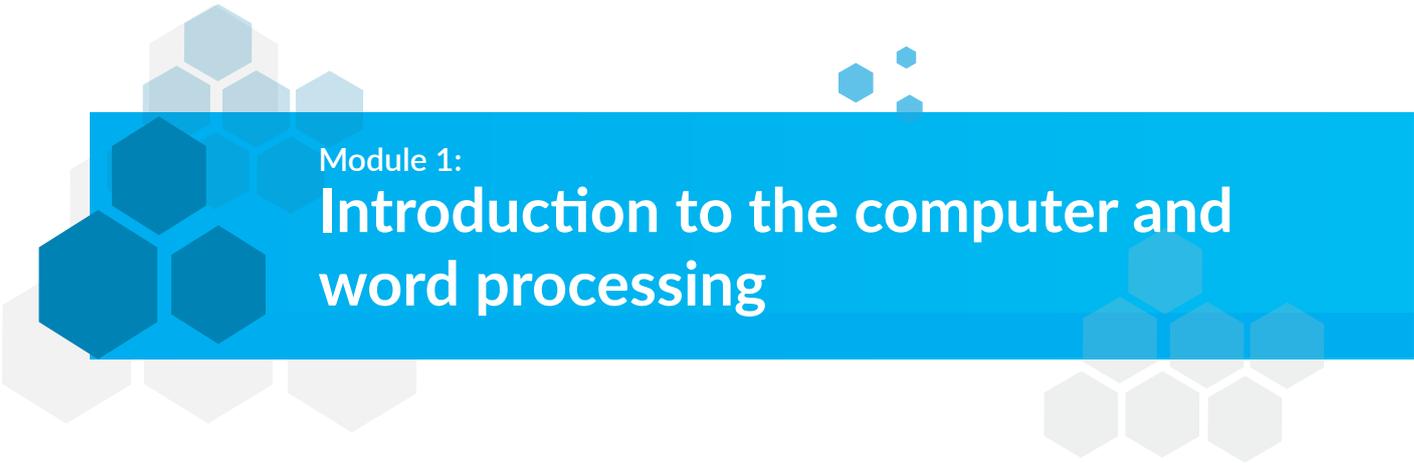
Successful completion of the Key Assignments will support students in their task assignment.

Course overview:

Modules and learning outcomes

Module	Unit	Learning outcomes
1. Introduction to the computer and word processing	1. Introduction to computers	<p>The student will be able to:</p> <ol style="list-style-type: none">1. Understand and explain key concepts relating to Information and Communication Technology and computers.2. Understand and explain key concepts relating to devices, storage and software.3. Explain the key concepts in relation to file storage, management and retrieval.4. Demonstrate an ability to use basic computer functions effectively.
	2. Introduction to word processing	<p>The student will be able to:</p> <ol style="list-style-type: none">1. Create documents and understand how and where to save them.2. Work with a word processing document, apply different formats and insert tables and images.3. Proof and edit a document before printing.4. Identify files and folders and recognise common file types. Understand what a file and folder is and know where files, folder and programmes are normally stored.

Module	Unit	Learning outcomes
	3. The internet and email	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the concepts and associated risks of the internet and the World Wide Web. 2. Use a web browser and manage settings. 3. Search effectively for information on the internet by using key words, quotation marks for exact phrases and advanced search options. 4. Understand the structure of an email and be able to create, send and receive email with consideration of security concerns and risks.
2. Introduction to other software packages and applications	1. Spreadsheets	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Identify suitable uses for spreadsheets. 2. Create a spreadsheet and enter numeric and character data, apply formulas while understanding their purpose to generate results, format cells and generate a chart and print it. 3. Create and understand logical formulas using standard functions.
	2. Introduction to the graphical presentation of data	<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Use presentation application software to create an effective presentation and promotional materials. 2. Investigate image editing software. 3. Demonstrate an ability to edit, enhance and present a variety of information graphically.



Module 1:

Introduction to the computer and word processing

PURPOSE

This module has been designed for students with no formal or previous experience in Information and Communication Technology. It will provide an introduction to a range of practical skills and underpinning knowledge that will enable students to use computers confidently in their everyday lives and allow for differentiated learning experiences for the students.

AIMS

This module aims to:

- Introduce students to the essential elements of computer hardware and software
- Provide students with the opportunity to use common computer packages and applications develop digital literacy skills
- Encourage students to develop good work habits in the use and care of the computer and equipment.

UNITS

Unit 1: Introduction to computers

Unit 2: Introduction to word processing

Unit 3: The internet and email essentials

UNIT 1: INTRODUCTION TO COMPUTERS

Learning outcomes

The student will be able to:

1. Understand and explain key concepts relating to Information and Communication Technology and computers.
2. Understand and explain key concepts relating to devices, storage and software.
3. Explain the key concepts in relation to file storage, management and retrieval.
4. Demonstrate an ability to use basic computer functions effectively.

Teacher guidelines

The following provides a suggested selection of activities to fulfil the requirements of the learning outcomes:

- Discuss the students' use of computers in their everyday lives. Use this as an opportunity to explore the different types of computers, devices, packages and applications the students use.
- Students may investigate the different types of computers in use, identifying the strengths and weaknesses of laptops, PCs, tablets, etc.
- Establish ground rules for the use of computers in class including log-ins, user names, passwords, security, reporting malfunctioning equipment and shutting down.
- Explore the basic functions of a monitor, mouse and keyboard so that students can select items, move items and issue commands to the computer, click, double-click, move with click and drag.
- Explore the differences between hardware and software. If possible, teachers could use a functioning or non-functioning computer to investigate the parts and internal functioning of a computer.
- Using contextual tasks, students should explore the functionality of the applications to be used in class.
- Explore the practical troubleshooting for computer set up and applications. Students should devise a troubleshooting guide for use in class.
- Establish a protocol with students for saving, retrieving and storing documents and files.

UNIT 2: INTRODUCTION TO WORD PROCESSING

Learning outcomes

The student will be able to:

1. Create documents and understand how and where to save them.
2. Work with a word processing document, apply different formats and insert tables and images.
3. Proof and edit a document before printing.
4. Identify files and folders and recognise common file types. Understand what a file and folder is and know where files, folders and programmes are normally stored.

Teacher guidelines

The following provides a suggested selection of activities to fulfil the requirements of the learning outcomes:

- Using relevant contextual tasks students should create, save, file and retrieve documents.
- Explore the formatting functions of a word processing package by changing text formatting, font types, font size, bold, underline, italics, cutting and pasting text. Students could discuss issues such as user experience and functionality when adjusting and formatting text.
- Students could experiment with inserting graphics, images and tables into a document and adjusting formatting as required.
- Explore the help functions of the application and how they may be of assistance in completing tasks.
- Use group/pair work to proof documents before printing. Discuss the merits and pitfalls of tools such as spell-check and establish protocols for use.
- Explore how to print preview and print a document from an installed printer using output options, entire document, specific pages, and number of copies.
- Discuss the main types of storage media such as internal hard disk, USB flash drive, online/cloud file storage that students may use to save their documents.

UNIT 3: THE INTERNET AND EMAIL ESSENTIALS

Learning outcomes

The student will be able to:

1. Understand the concepts and associated risks of the internet and the World Wide Web.
2. Use a web browser and manage settings.
3. Search effectively for information on the internet by using key words, quotation marks for exact phrases and advanced search options.
4. Understand the structure of an email and be able to create, send and receive email with consideration of security concerns and risks.

Teacher guidelines

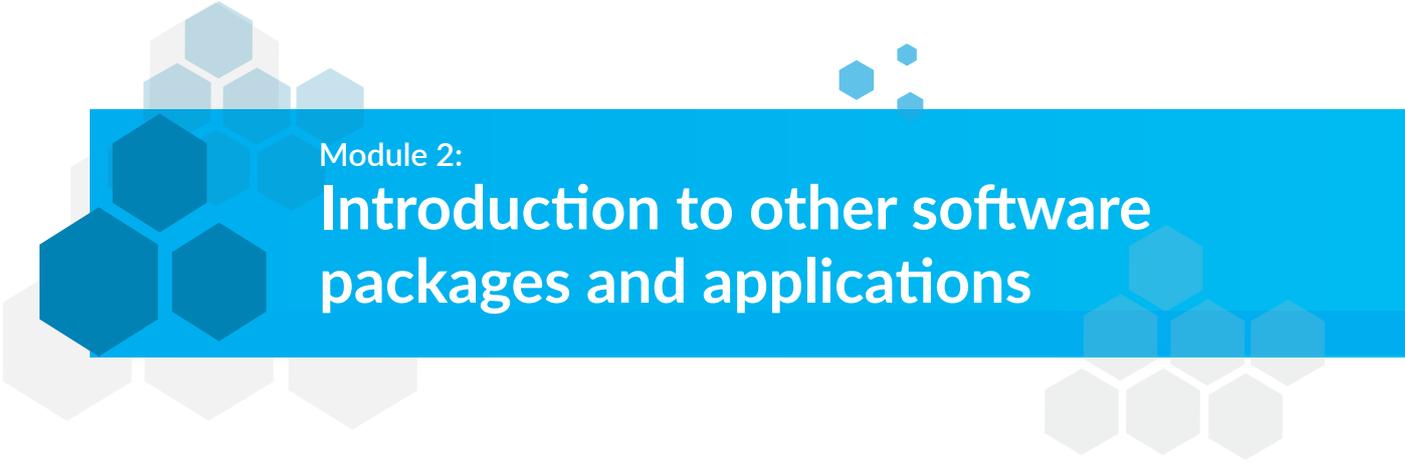
The following provides a suggested selection of activities to fulfil the requirements of the learning outcomes:

- Investigate what the internet is. Explore the concepts of a global, physical network of networks and how it is used to support services like the World Wide Web (WWW) and email.
- Compare and contrast the types of resources available on the World Wide Web and the importance of evaluating information on the web.
- Explore what an internet service provider does and how it works in your school.
- Use a web browser and a search engine on the internet and evaluate information on the World Wide Web.
- Students could investigate the functions of a home page, and explore terms such as URL, hyperlink, favourites/bookmarks, browser history, web page, cookies, and search engines.
- Explore the functions of a search engine by using key words, exact phrase and advanced search options in order to print a web page; download a file and a webpage.
- Investigate social networking websites, internet forums, chat rooms, online computer games, and blogs and discuss the risks associated with online interactions including issues such as cyber-bullying and the digital age of consent.

- Explain what phishing is and show examples.
- Get the students to set up an email address to create, send, and receive email and discuss the security risks involved.
- Students could explore terms such as: address book, inbox folder, sent items, new message, mail address, address field, send and reply, forward, email account, email attachment, virus and the security risks associated with opening email attachments.
- Investigate email etiquette in the use of cc and bcc.
- Develop an awareness of malware from various sources, including on mobile devices.
- Students could record and understand a glossary of key terms.

MODULE 1: KEY ASSIGNMENTS

1. Use word processing software to create, store, edit and print a range of documents for specific purposes.
2. Ethically research a topic online for another module and produce a short report on it which includes formatted graphics and text, and email it to a named recipient.



Module 2:

Introduction to other software packages and applications

PURPOSE

This module has been designed for students with no formal or previous experience in Information and Communication Technology. It will provide an introduction to a range of practical skills and underpinning knowledge that will enable students to use computers and the associated technology confidently in their everyday lives.

AIMS

This module aims to

- Provide students with the opportunity to use common computer packages and applications
- Familiarise students with the basics of spreadsheets and spreadsheet software.
- Familiarise students with the basics of computer graphics and graphics software.

UNITS

Unit 1: Introduction to spreadsheets

Unit 2: Introduction to the graphical presentation of data

UNIT 1: SPREADSHEETS

Learning outcomes

The student will be able to:

1. Identify suitable uses for spreadsheets.
2. Create a spreadsheet and enter numeric and character data, apply formulas while understanding their purpose to generate results, format cells and generate a chart and print it.
3. Create and understand logical formulas using standard functions.

Teacher guidelines

The following provides a suggested selection of activities to fulfil the requirements of the learning outcomes:

- Using relevant contextual tasks, students could work with spreadsheets and save them in different file formats.
- Explore how to use the help function.
- Students should explore entering data into cells and performing basic calculations.
- Students can investigate how to select, sort and copy, move and delete data, edit and manipulate rows and columns in a worksheet, copy, move, delete, and rename worksheets.
- Using inputted data or a data source, students can explore the functions of spreadsheets to communicate information through charts, graphs and tables.
- Using groups or pairs, students can check and correct spreadsheet content before printing.
- Students could record and understand a glossary of key terms.

UNIT 2: INTRODUCTION TO THE GRAPHICAL PRESENTATION OF DATA

Learning outcomes

The student will be able to:

1. Use presentation application software to create an effective presentation and promotional materials.
2. Investigate image editing software.
3. Demonstrate an ability to edit, enhance and present a variety of information graphically.

Teacher guidelines

The following provides a suggested selection of activities to fulfil the requirements of the learning outcomes:

- Depending on the applications available, students can work with various presentation software applications and save them in different file formats.
- Choose online and inbuilt assistance such as the help function, within the application to enhance a presentation.
- Compare and contrast different presentation views and discuss when to use them.
- Explore the use of different slide layouts and designs. In this exploration, students can create and format charts, insert and edit pictures and images and apply animation and transition effects.
- Explore image editing. Free software such as GIMP, Paint.net or PhotoScape may be a starting point or if resources allow, Photoshop or other Adobe software may be used.
- Utilise software to enhance the presentation of information. In groups or pairs, discuss the merits of different presentation techniques for aiding clarity of communication.
- Graphically present information in a variety of formats.

Module 2: Key Assignments

1. Select your best spreadsheet that demonstrates your use of formulas to perform calculations for a task you are involved in.
2. Select charts that demonstrate your use of bar charts or pie charts and save or print the results in graphic format and interpret these results.
3. Create a promotional document for display that effectively communicates information using a combination of graphics, text and images.

