

Information and Communication Technology (ICT)

1. Introduction

The ICT program is designed to create a balance between the imparting of skills, the acquisition of techniques and knowledge, the growth and awareness of the students' personal responses. It challenges all students by providing opportunities for different needs and learning styles. Also, it encourages students to explore the role of technology in both historical and contemporary contexts. And lastly, it contributes to raising students' awareness of their responsibilities as world citizens when making decisions and taking actions on technology issues.

1.1 Teaching and Learning Approaches and Strategies

A variety of learning and teaching approaches are interwoven and deployed to suit and challenge all students by providing opportunities for different needs interests, abilities, prior knowledge and learning styles. Students are assessed against defined assessment criteria and not against other students

Pedagogical approaches including

Inquiry & Investigation

Direct instruction

Scaffolding

Co-construction

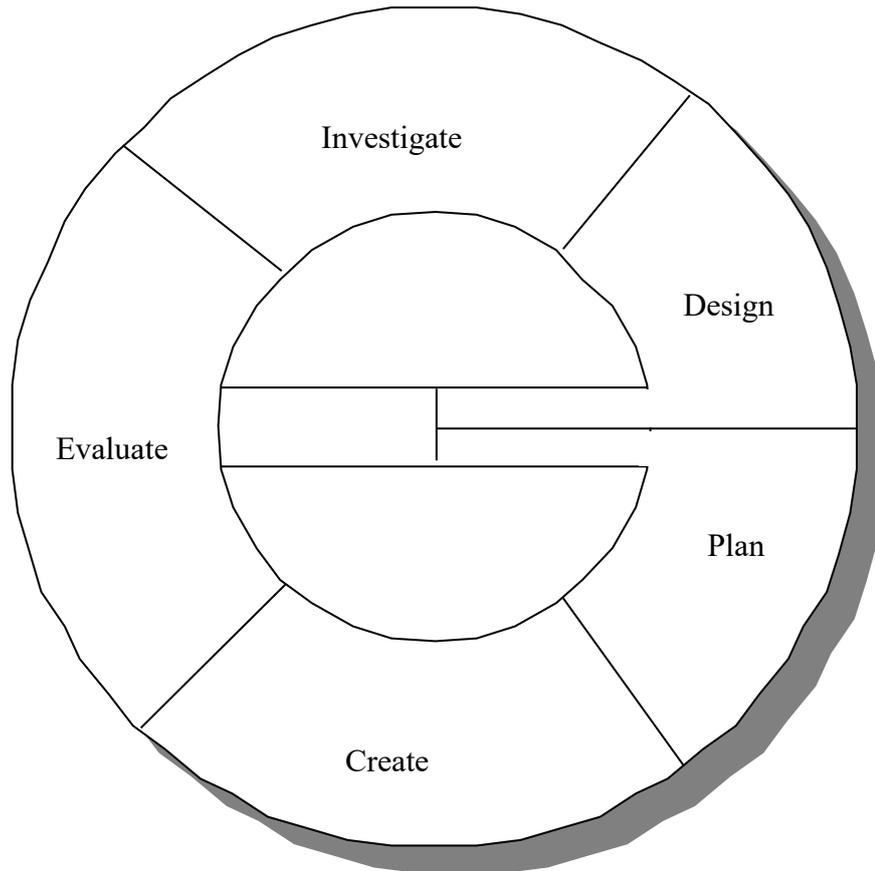
e-Learning and flipped classroom

1.2 The Design Cycle

Students will be assessed according to level descriptors designed for the stages of the design cycle for each project. Some of the stages of the Design Cycle will be assessed for projects in S1. All of the stages will be assessed for projects in S1 to S3.

Investigate

Show that you have researched and analyzed the problem to be solved, the IT skills required, and have used appropriate sources. This should be written in an organized manner.



Design

Generate several feasible designs that meet the design specification and to evaluate these against the design specification. You will then select one design, justify your choice and evaluate this in detail against the design specification.

Plan

Construct a clear and thorough plan on how to create your chosen product/solution that has a series of logical steps, and that makes effective use of resources and time. Indicate how you will organize your time and resources. Evaluate the plan and justify any modifications to the design.

Create

Follow your plan using appropriate tools to create your original product/solution. Create a Journal showing all the steps of how you created your product/solution, including all the mistakes and corrections you made along the way and why you made any amendments.

Evaluate

Evaluate the effectiveness, quality, and efficiency of your final product/solution. Include improvements that could be made.

Attitudes in Technology

It is expected that students will motivate themselves to enthusiastically and independently create products/solutions that are interesting and engaging. Students are expected to adhere to deadlines and make themselves aware of all assessment criteria.

2. The aims of ICT

The aims of Information and Communication Technology are to:

- encourage an awareness of the impact of technology
- develop an appreciation of the international, intercultural aspects of technology
- provide a variety of technological information and ideas
- encourage curiosity, ingenuity, resourcefulness and discrimination
- stimulate self-confidence through the knowledge and application of technology
- develop practical skills through the creation of products/solutions
- promote effective, informed, appropriate communication
- foster responsibility for designs, decisions, actions and assessment
- promote effective co-operation and respect for individual differences when responding to technological challenges
- develop logical-thinking skills.

3. Framework of Junior Secondary ICT Curriculum

S1

Branches	Topics
Computer Systems	- Introduction to modern computer systems. - Understanding bit, Byte and units of information.
IT Skills, Applications and Social Issues	- Schoology, Google drive and its web services. - Touch typing. - Basic image editing techniques and applications. - Spreadsheets: functions, formulas, data handling and representation. - Readings on social issues related to technology.
Programming	- Procedural programming in App inventor 2. -STEM with Micro:Bit

S2

Branches	Topics
Computer Systems	<ul style="list-style-type: none"> - Computer systems: organization, hardware and software. - Peripheral and storage devices.
IT Skills, Applications and Social Issues	<ul style="list-style-type: none"> - Spreadsheets: functions, formulas, data handling and representation. - Basic 3D modeling and printing. - Video and audio editing techniques. - Readings on social issues related to technology.
Programming	<ul style="list-style-type: none"> - Procedural programming in App inventor 2.

S3

Programming	<ul style="list-style-type: none"> - Procedural programming concepts: functions, variables and branching and loops. - Designing mobile apps for Android devices. - Web technologies: HTML, CSS and interactive web pages.
IT Skills, Applications and Social Issues	<ul style="list-style-type: none"> - Advanced image editing skills in Photoshop: layer effect, masking and different ways of making a precise selection. - Advanced word processing skills
Programming	<ul style="list-style-type: none"> - Procedural programming in App inventor 2. - Python and A.I. application.

S1 – S2 CASTLE

BBC micro:bit Learn to code your pocket-sized computer	-This module will make you a creator, an innovator, a leader in an increasingly digital world filled with robots. With a solid understanding of electronics, sensors, and computer science principles, you will be primed to progress to harder concepts like IOT, AI, Machine learning.
Learning Python with Minecraft	-The simplified version of Jupyter Notebook embedded in Minecraft Education Edition is used in the course. Students do not need to know Minecraft or Python before class, and you can solve the problem by writing Python to pass challenges. Basic knowledge of Python will be taught, including syntax (Syntax), variables (Variable), data types (Type), File statement (Condition), iteration/loop (Iteration/Loop), function (Function) and list (List) etc.
Introduction to A.I. (Artificial Intelligence)	<ul style="list-style-type: none">- Learn the Python basic- Learn Microsoft Azure Cognitive Services- Use python to work on A.I. analysis project, e.g. movie comments, facial recognition, using Anomaly Detector for case study

S3 Module

Artificial Intelligence	<ul style="list-style-type: none">- Understand what Artificial Intelligence is and its 3 major application areas- Develop your own Artificial Intelligence project using Python
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4. Delivery Schedule

	S1	S2	S3
1 st term	<ul style="list-style-type: none"> ➤ Schoology, Google drive and its web services. ➤ Procedural programming in App Inventor 2 ➤ Introduction to modern computer systems ➤ Understanding bit, Byte and units of information ➤ Touch typing. 	<ul style="list-style-type: none"> ➤ Video and audio editing techniques ➤ Procedural programming in App inventor 2. ➤ Computer systems: organization, hardware and software ➤ Peripheral and storage devices 	<ul style="list-style-type: none"> ➤ Advanced photo editing skills in Photoshop ➤ Procedural programming concepts. ➤ Designing mobile apps for Android devices
2 nd term	<ul style="list-style-type: none"> ➤ Spreadsheets: Functions and formulas ➤ Basic image editing techniques and applications ➤ Computer literacy ➤ Basic 3D modeling and printing ➤ STEM with Micro:Bit 	<ul style="list-style-type: none"> ➤ More advanced spreadsheets: Functions, formulas, data handling and representation ➤ Basic 3D modeling and printing 	<ul style="list-style-type: none"> ➤ Project: Create an Android app to solve a problem ➤ Advanced word processing skill ➤ Web technologies: HTML, CSS and interactive web pages ➤ Python and A.I. application.

5. Summative and Formation Assessment

5.1 Summative assessment

Summative assessment is the judgment made by the teacher of the standard of achievement reached by each student at the end of the year, which is carefully designed to measure the level of achievement expected for the relevant year.

5.2 Formative Assessment

The following shows how various aspects of students' work could be assessed formatively.

- Preparation for class
- Participation in class
- Identifying and considering strategies
- Using and acknowledging a variety of sources for research effectively
- Communicating ideas and information
- Managing time
- Working as a member of a group/Collaborative skills
- Working independently and confidently with self-motivation and a positive attitude
- Examining the efficacy of his/her own planning process
- Punctuality in meeting deadlines
- Taking responsibility for personal learning

5.3 Assessment for Learning

S1 – S3

Worksheet exercises, online pre-lessons, quiz and practical assignments – 50%

Individual/group projects – 50%

5.4 Assessment criteria

Criteria:-	Grades
A. Knowledge of Topic	30-50%
B. IT Skills and Applications	30-50%
C. Programming skill	30-50%
Overall	100%

5.5 Grade descriptors and boundaries

Grade	Boundaries
1	0-39
2	40-59
3	60-69
4	70-79
5	80-89
5*	90-94
5**	95 - 100

6. The role of parents at home and home learning

In ICT, students are assessed through continuous assessment. Both **effort in project -based learning and the demonstration of organization of learning** during the lesson time will dominantly count for the assessment. Class time will be given for designated tasks to be completed, where interactions within groups and amongst students will take place and will accordingly be duly assessed.

As a consequence, there should not be a need for ICT project to be completed at home. Students are encouraged to manage their time effectively and will work to 'deadlines' where projects must be completed by certain dates. When needed, time will be made available at lunchtimes or after school for students who wish to keep working on their projects in school. For students with an interest in developing their computer skills at home and at school they will be strongly encouraged to do so.

Students are required to read technology related materials from time to time. Parents can help if students find difficulty in some technical terms or special names. Presentation will be requested for sharing their understanding.

Written assignments are usually started in class and are completed as home learning. Deadlines for each assignment are extremely important and it is essential that each student make every effort to hand in work on time.

Parents having problems with regard to home learning should consult the ICT teachers.