Computing Rationale (Why study computing)

To participate and make informed decisions in today's world, all citizens require technological and information literacy skills that include the ability to gather, process, and manipulate data. These skills are now as essential as traditional numeracy and literacy.

UK and the rest of the world are becoming highly computer-literate societies with a large percentage of businesses and households connected to the information super highway. Computer technology and the information highway are also providing new opportunities for learning. Now a candidate in remote or rural part can have the same access to resources as a candidate in a large urban centre.

Computers are also quickly changing the way we work. Traditional jobs, such as those in the banking industry, are still dominating, however, new areas of economic activity, such as multimedia production, are growing rapidly. As well, how and where we work continues to evolve as technology impacts on the workplace.

As well as the rapid development of new technologies that gather, organise, and share information, familiar technologies like television, telephone, and computers are evolving and being expanded by digitised information, causing a convergence of technologies.

The challenge for candidates and instructors is to develop an understanding of the fundamentals of information literacy and the tools required to prepare for, and participate in, an evolving information-based society. Candidates need to have a firm grounding in computing for their careers, for lifelong learning, and for recreation. The computing curriculum provide candidates with the analytical, interpersonal, and technical skills they require to be active participants in an exciting and dynamic world.

BCE courses focus on what candidates must know and understand about computing in order to be effective and productive. There are at least four broad categories of rationale motivating an understanding of computers: *personal*, *workforce*, *educational*, and *societal*.

Personal rationale - today's world is increasingly an information society. Computers and communications not only perform routine tasks like controlling a flying jet or connecting cellular phones, but with the Internet they give the computer-capability among other things, access to much of the world's digital information and the means to process it - from planning a holiday to locating the best place to buy books or best supermarket.   Many of us find that the use of information technology is a valuable enhancement to our way of life. Computers help people to keep in contact with family and friends via e-mail, manage finances with spreadsheets and online banking, track investments through online brokers, do homework and projects using word processing and graphing tools, find medical information, read news, track environmental issues and monitor public policy issues over the World Wide Web.

Workforce rationale - in today's workplace, information technology is increasingly common. If the nation is to obtain the maximum benefit from its investments in computerisation, a labour pool capable of using it appropriately is necessary. It is obvious that individuals who work with information and knowledge need to understand the ubiquitous technologies, but it is also true that

few job adverts require no knowledge of computers at all. For example, the clerk in a retail establishment at one time had only to know how to use a cash register. Today, the same clerk can come into contact with inventory systems, online order tracking, credit card and other business systems, which are becoming more sophisticated and integrated.

Though a company must train its employees in the use of its business systems, it is naïve to consider such training as a one-time activity. The systems are upgraded frequently and become more complex. Obviously, this training task is greatly simplified if the employee is already well educated in computers, as the employee require less training overall. Further, they will probably utilise existing systems more fully and adapt to upgrades better. Employee productivity is directly affected by the employees' knowledge of computing.

From the employee's point of view, expertise in computing is valuable. It not only leads to the simple satisfaction of performing one's job well and nimbly responding to problems; it can also improve job mobility. More facilities with a company's information technology infrastructure can be a valuable job asset that may be considered in promotions. Finding a job at another company will entail learning new computer systems, but understanding them more abstractly knowing which features should be common and how they might differ is also an asset in a labour market where employees no longer enjoy a "job for life."

Educational rationale - computer technology is an enabler for many new types of educational opportunities. Computers can be the means for educators "to support the development of new ways of thinking and learning". We believe that computers can be a conduit of powerful ideas and "the seeds of cultural change", helping people form new relationships with knowledge that cuts across the traditional lines separating humanities from sciences and knowledge of the self.

Information conveyed through advanced information technology such as computers and the World Wide Web can appear more convincing than the same information conveyed through a conversation with a stranger or the newspaper, despite the fact that it may have equivalent accuracy and validity.

Technology is a unique mode of human operation and is therefore worthy of study on its own merits. In other words, technological achievements are as much a part of our culture as literacy, scientific or artistic achievements and, as such, deserve study as a part of general education.

Societal rationale - in today's increasingly technological society, many public policy debates are connected to information technology. For example:

A person with a basic understanding of database technology can better appreciate the risks to privacy entailed in data-mining based on his or her credit-card transactions.

A jury that understands the basics of computer animation and image manipulation may have a better understanding of what counts as "photographic truth" in the reconstruction of a crime or an accident.

Understanding choices about representation of information can be key to understanding how copyright laws may apply to information in electronic media.

Some basic understanding of information technology is needed to make informed judgments about public policy issues, many of which have a direct impact on the local population whether or not they use information technology in their daily lives.

Aim and approach of Computing Curriculum

Certificate Level

Certificate level provide candidates with the fundamental knowledge, skills, and attitudes needed for a lifetime of using computers. Issues of ergonomics, ethics, and the safe use of tools are included, as are connections to larger social issues such as security of information, copyright, and ethical issues. This level emphasise on:

- acquiring skills for using information technology tools
- developing the knowledge and skills to formulate questions and to access information from a variety of sources
- exploring careers and occupations related to information technology
- developing suitable attitudes and practices about safety and ergonomics in the use of information technology tools
- developing an understanding of the ethical use of information technology
- developing a positive attitude toward using information technology as a tool for lifelong learning
- undertaking coursework research

Achievements Expected - *It is expected that on completion of the certificate level, candidates will be able to:*

- identify information technology tools used to access information
- protect information using information technology tools
- enter information accurately using appropriate keyboarding techniques and software that allows for the storage, retrieval, and editing of material
- demonstrate the ability to formulate questions and to use a variety of sources and tools to access, capture, and store information
- use appropriate information technology terminology
- evaluate a variety of input and output devices
- demonstrate the difference between software and operating system
- describe and practise appropriate safety procedures when working with information technology tools
- demonstrate the ability to understand the Internet
- demonstrate an understanding of the ethical use of information
- demonstrate an awareness of the impact of electronic resources on education, careers, and recreation
- evaluate the impact of information technology tools on the workplace, on individuals, and on society
- produce detailed project/coursework based on research.
- Identify different components of the computer

Diploma Level

Diploma level allow candidates to select, organise, and modify information to solve problems. Candidates develop skills in selecting appropriate computer technology tools, and they learn to use these tools to access and structure information to analyse problems, synthesize ideas, and justify opinions or values. Candidates also gain an understanding of time, resource, and project creation. In addition to learning the principles of computing, candidates develop skills in integrating information systems, programming, networking, graphics, web design and database management. This level emphasise on:

- producing detailed coursework
- awareness of multiple solutions for a computing problems

- thinking critically to determine and develop the most effective program platform
- produce highly written programs
- evaluating and selecting information based on specific requirements
- personal relevance of problems involving technology
- developing information literacy by accessing, evaluating, synthesising, making inferences, validating, and creating information using appropriate information technology tools
- understanding the ethical use of information
- apply a variety of trouble-shooting techniques related to programming, networking and database design.
- undertaking coursework research

Achievements Expected - *It is expected that on completion of the diploma level, candidates will be able to:*
- apply detailed computer skills
- be able to access, capture, and store information
- prepare well written programs using different programming tools
- use a variety of information technology tools to help solve IT problems
- apply predetermined search criteria to locate, retrieve, and evaluate information
- create electronic text documents
- design and deliver integrated business presentations using presentation software
- prepare database and spreadsheet files and create various problem-solving reports using searches, sorts, and queries
- synthesise information from a variety of electronic sources for their presentations
- use information technology tools to gather and organise information and produce documents evaluate the suitability of information technology tools for solving problems related to specific tasks
- demonstrate an understanding of computing, using a variety of tools
- identify different careers related to the field of computing.
- identify networking manufacturers and hardware equipment
- identify different computer technological fields
- demonstrate the ability to use different software programs that can be shared within a network
- evaluate networking, programming, database and web design technology

Advanced Diploma

Advanced Diploma provides candidates with an understanding of how to communicate, implement ideas effectively using a variety of information media. In addition to learning the principles of advanced computing, candidates develop skills in integrating information systems, programming, networking, graphics, web design and database technology. This level emphasise on:

- gaining advanced knowledge in programming, networking and database technology
- evaluating different computer programs
- applying the principles of programming and design to develop effective programs
- differentiating between computing jobs
- using a variety of computing tools to synthesize the presentation of ideas and information
- thinking critically to determine and develop the most effective program platform
- produce highly written programs
- computer diversity awareness

Achievements Expected - *It is expected that on completion of the Advanced Diploma level, candidates will be able to:*
- be innovative
- develop critically thinking skills

- produce detailed project work based on advanced research
- effectively use networking, programming and database tools.
- identify and consider ethical and legal issues when presenting information
- use a variety of software to create documents
- demonstrate the ability to arrange information in different forms to create new meaning
- analyse the effects of computer programming
- apply a variety of trouble-shooting techniques related to programming, networking and database design.
- demonstrate an awareness of the impact of information technology tools on society
- identify most sought out careers and occupations that use information technology
- evaluate different software and defend their use in solving problems
- describe the effect of multimedia presentations on intended audiences
- apply knowledge into entrepreneurship