Advanced Diploma in Computer Science

The Advanced Diploma in Computer Science prepare candidates for further education or employment. With the rapid developments in technology, advances in new computer systems and programs launched daily, computer science qualification offer many attractive career opportunities in technology and information management. Organisations of all sizes are looking for skilled professionals who hold a computer science qualification for a variety of critical projects including networking, technical applications, and developing efficient programs and applications. The advantage of computer science is it touches a number of fields including programming, networking, software engineering and management science. The Advanced Diploma gives a lot of metadata. Candidates who complete the Advanced Level learn much in computer science and also find it easy to adopt further studies.

Why does the course exists – The Advanced Diploma in Computer Science is designed to provide in-depth study and analysis of computer programming languages and applications, along with understanding algorithms, advanced computations, and machine language. The course also explore critical aspects such as systems architecture, database technology, computer engineering, and management science.

How it fits into the larger programme – The Advanced Diploma is the highest qualification offered by BCE. The course units Database Technology, Visual Basic .Net, C Programming, Computer Systems Architecture, Management Science, Data Communication & Networking and Software Engineering; the most recognised topics in computing. The computer science offers a variety of technical, mathematical, and analytical approach that challenge candidates to acquire new skills.

For whom it was designed – This course is designed for Diploma in System Design holders or equivalent, interested in further computing studies or advancing themselves academically.

How it will benefit candidates – The course concentrates on the most sought out topics in computing – leading to better employment or higher education entrance.

Subjects:
- Computer Systems Architecture
- Database Technology
- Management Science
- Data Communications and Networking
- Software Engineering
- Visual Basic .Net & C Programming

Computer Systems Architecture - IT professionals often have to make decisions on what hardware to buy - what is the best value for the money in the budget and the client needs. The more one knows about computer architecture, the more informed one is likely to make good decisions. Knowledge of CPU, I/O and multitasking operations is extremely important.

Database Technology - The essential feature of database technology is that it provides an INTERNAL representation (model) of the EXTERNAL world of interest. Examples are the representation of a particular date/time/flight/aircraft in airline reservation or of item code/item description/quantity on hand/reorder level/reorder quantity in a stock control system. *Why is it important?* Business in much of world depends on database technology. For example: *Finance:* the UK clearing banks have calculated that if their database systems were removed it would take every person in UK working 24 hours per day, 7 days per week to process all the financial transactions manually. The London stock exchange relies on computer systems for recording buying and selling of stock which happens very quickly and in large quantities. The amount of money involved in these transactions is enormous. *Transport:* All the airlines use online seat reservation systems and have systems for scheduling aircraft, for building and maintaining timetables, for handling the in-flight catering and for mechanical servicing of the planes. Similar systems exist for rail, sea and road transport. They all use database technology extensively. *Utilities:* the major utilities (water, electricity, gas) all have generation/distribution systems based on database technology. *Resources:* The mineral exploration/extraction companies, and governments who regulate them (especially for oil exploration/extraction) have extensive databases which have complex data structures (usually including GIS (Geographical Information System)) components. *Production engineering:* from scheduling workflow through the production lines of machines to stock control and order processing, database technology underpins all activity in this area. *Environment:* protection and control of the environment by government agencies depend heavily on database systems with GIS facilities, together with databases of toxic substances and clean-up recommendations. *Tourism:* hotel systems and local tourist attractions, information and booking facilities rely on database systems, and the major package tour operators have extensive databases for holiday planning and booking, together with financial systems for payment and invoicing. *Leisure:* the entertainment industry uses database systems extensively for theatre, concert and cinema ticket bookings. *Culture:* museums, art galleries, history exhibitions - all utilise database technology (and especially multimedia database technology) for cataloguing their collections and recording access to them. *Education:* courses, materials, and assessment all rely heavily on database technology in all sectors of education. Increasingly the linking of database technology with hypermedia delivery systems allows courseware to be maintained up-to-date and delivered to the consumer. *Healthcare:* healthcare has long relied on database technology to schedule hospital beds or appointments at clinics or doctor's surgery. *Government administration* would be paralysed without database technology; the collection of taxes and the payment of social security benefits depend totally on database technology. *Retail:* the major retail stores utilise database technology in stock control and PoS (Point of Sale) systems. Modern retailers use advanced data mining techniques to determine trends in sales and consumer preference to optimise stock control, retail performance, customer convenience and profit.

Management Science - Management Science is a field of study characterised by the use of mathematical and computer models for decision making. Its origins can be traced to Operations Research. Management Science is concerned with developing and applying models and concepts that may prove useful in helping to illuminate management issues and solve managerial problems. Applications of Management Science are abundant in industry and government. Airlines and overnight mail systems use mathematical models to create efficient, dependable flight schedules.

Data Communications and Networking - Computer communication and computer networks have become very important areas in the last decade. It is virtually impossible to imagine an important major computer system today that isn't heavily involved in communication. The Internet has grown in size, speed and penetration enormously and changed the working habit of many persons. The rapid change and expansion of the network have also changed the requirement on the technology used.

Software Engineering - Software Engineering is the discipline providing methods and tools for the construction of quality software with a limited budget and a given deadline, in the context of constant requirements change. It involves the elicitation of the system's requirements, the specification of the system, its architectural and detailed design. In addition, the system needs to be verified and validated, a set of activities that commonly take more than 50% of all development resources. Testing techniques and tools, at different levels (unit, integration, system) are needed. Software development being a human intensive process, management and quality control techniques are also required to run successful projects and construct quality systems.