NCC education®

Awarding
Great British
Qualifications

LEVEL 3 DIPLOMA IN COMPUTING

(L3DC)

NCC Education
Qualification Unit Specification
2020/21

Modification History

Version	Revision Description
V1,8	Update to TQT and new cover
V1.9	Added 4.6 – Eligibility Period
V2.0	Added 'Objective' in section 1.1 – 22/05/2019
V2.1	Added grading algorithm statement in *Section* 6 Results and Certificates
V2.2	Replacing IT Skills with Culture Studies, and Mathematical Techniques with Foundation Mathematics
V2.3	Updated NOS January 2020

Published by: NCC Education Limited, The Towers, Towers Business Park, Wilmslow Road, Didsbury, Manchester M20 2EZ UK

Tel: +44 (0) 161 438 6200 Fax: +44 (0) 161 438 6240 Email: info@nccedu.com
http://www.nccedu.com

CONTENTS

1. About NCC Education

NCC Education is a UK awarding body, active in the UK and internationally. Originally part of the UK National Computing Centre, NCC Education started offering IT qualifications in 1976 and from 1997 developed its Higher Education portfolio to include Business qualifications, IT qualifications for school children and a range of Foundation qualifications.

With Centres in over forty countries, four international offices and academic managers worldwide, NCC Education strives to employ the latest technologies for learning, assessment and support. NCC Education is regulated and quality assured by Ofqual (the Office of Qualifications and Examinations Regulation, see www.ofqual.gov.uk) in England and Northern Ireland.

1.1 Why choose this qualification?

NCC Education's Level 3 Diploma in Computing is:

- **Regulated** by Ofqual and listed on the Qualifications and Credit Framework – Qualification Number 600/6407/9. The Regulated Qualifications Framework (RQF) is a credit-based qualifications framework, allowing candidates to take a unit-based approach to building qualifications.

  For more information see:

  http://ofqual.gov.uk/qualifications-and-assessments/qualification-frameworks/

- **Quality assured** and well established in the UK and worldwide

- **Recognised and valued** by employers and universities worldwide

- The NCC Education Level 3 Diploma in Computing (RQF) is an Applied General qualification which allows candidates to demonstrate key transferrable study skills, mathematical competency and applied cultural understanding, especially in the area of digital culture, as well as an understanding of the essential concepts of computer programming.

Objective

In addition, successful candidates will fulfil the main entry requirements for NCC Education's Level 4 Diploma in Computing or Level 4 Diploma in Business IT, as well as opening up opportunities to access a range of higher education courses or employment. Examples of higher education opportunities include, but are not limited to, progressing to university degrees in Software Engineering or Computer Science, Computer Networking Systems, Digital Media Technology, Computer Forensics and Security. Examples of employment opportunities include roles such as IT Helpdesk Professional, Data Entry Clerk, IT Support Technician and Computer Service and Repair Technician.

The Level 3 Diploma in Computing syllabus and assessment is suitable for students aged 16-19 as well as adult learners.

The above purpose is stated in the Qualification Specification, Section 1.1, Page 4. The Qualification Specification is published on the NCC Education website at: http://www.nccedu.com/our-qualifications/foundation/ncc-education-level-3-diploma-in-computing-(qcf)

2. Structure of the L3DC Qualification

Qualification Title, Credits, Units and Level
NCC Education Level 3 Diploma in Computing (RQF), 60 credits, all at RQF Level 3. **Total Qualification Time: 600 hours** **Guided Learning Hours: 305 hours.** **Candidates must pass all 5 Units to be awarded the L3 Diploma in Computing certificate.**

Study and Communication Skills (20 credits)	Foundation Mathematics (10 credits)	Culture Studies (10 credits)
Introduction to Computer Science (10 Credits)	Introduction to Programming (10 Credits)	

Please see Section 5 below for Syllabuses, which include the Guided Learning Hours and Total Qualification Time for each Unit of the Level 3 Diploma in Computing.

This qualification is regulated by Ofqual and listed on the Qualifications and Credit Framework – Qualification Number 600/6407/9. For further information see http://register.ofqual.gov.uk/Qualification/Details/600_6407_9

3. Assessment for the qualification

3.1 Assessment objectives

All assessment for the qualification is intended to allow candidates to demonstrate they have met the relevant Learning Outcomes. Moreover NCC Education's assessment is appropriate to the assessment criteria as stated in this specification and is regularly reviewed to ensure it remains consistent with the specification.

3.2 Overview of Qualification Unit Assessment

Unit	Assessment Methods		
	Local Examination	Global Examination	Global Assignment
Study and Communication Skills	-	-	100%
Foundation Mathematics	-	100%	-
Culture Studies	-	-	100%
Introduction to Computer Science	-	100%	-
Introduction to Programming	-	-	100%

An examination is a time-constrained assessment that will take place on a specified date and usually in an NCC Education Centre. An assignment requires candidates to produce a written response to a set of one or more tasks, meeting a deadline imposed by the Centre.

The overall Unit mark is computed from the weighted mean of its components. The pass mark for a Unit is 40%.

NCC Education Centres can provide candidates with a specimen assessment paper as well as a limited number of past examination and assignment papers.

Past examination and assignment papers may be made available only following results release for the corresponding assessment cycle. Results release dates and past examination and assignment release dates can be found in the Activity Schedules area of *Candidate Registration Portal*, NCC Education's student registration system.

3.3 Accessibility of Assessment

We review our guidelines on assessment practices to ensure compliance with equality law and to confirm assessment for our Units is fit for purpose.

3.3.1 Reasonable adjustments and special consideration

NCC Education is committed to providing reasonable adjustments and special consideration so as to ensure disabled candidates, or those facing exceptional circumstances, are not disadvantaged in demonstrating their knowledge, skills and understanding.

Further information on NCC Education's arrangements for giving reasonable adjustments and special consideration can be found in the NCC Education *Reasonable Adjustments and Special Considerations Policy*.

3.3.2 Supervision and Authentication of Assessment

NCC Education Centres are required to organise all assessment activity for this specification according to NCC Education's Policies and Advice.

Candidates' identity and the authenticity of their work is verified and NCC Education moderates all assessment to ensure that the marking carried out is fair, and that the grading reflects the standard achieved by candidates as relevant to the specification Learning Outcomes and Assessment Criteria. Detailed guidance on this process and how candidate work must be submitted to NCC Education is given in NCC Education's *Examination Guidelines* and *Moderation Manual*. The Moderation Manual also includes full reminder checklists for Centre administrators.

4. Administration

4.1 Assessment Cycles

Four assessment cycles are offered throughout the year, in Spring, Summer, Autumn and Winter.

Examination dates and assignment submission deadlines are published in the NCC Education *Activity Schedule*, which is provided to Centres by Customer Services. It is also available on *Candidate Registration Portal,* NCC Education's student registration system.

The *Activity Schedule* also gives the key dates for registering candidates for assessment cycles, the dates when Centres can expect the assessment documentation and, ultimately, the assessment results from NCC Education.

4.2 Language of Assessment

All assessment is conducted in English.

4.3 Candidates

NCC Education's qualifications are available to those Centre candidates who satisfy the entry requirements as stated in this specification.

4.4 Qualification and Unit Entry Requirements

Entry Requirements
For entry onto the NCC Education L3DC qualification, students must: • have demonstrably previously studied in English at secondary school level or have a valid score of 5.5 or above in the International English Language Testing System (IELTS) Examination (or equivalent). The Level 3 Diploma in Computing syllabus and assessment is suitable for students aged 16-19 as well as adult learners.

4.5 Candidate Entry

Candidates are registered for assessment via NCC Education's *Candidate Registration Portal* system and according to the deadlines for registration provided in the *Activity Schedule*.

Further details can be found in NCC Education's *Operations Manual*.

4.6 Eligibility Period

The maximum period of time that NCC Education allows for the completion of your programme is three years. Please contact your Accredited Partner Centre if you have any queries relating to this.

4.7 Resits

If a candidate fails an assessment, they will be provided with opportunities to resit during the eligibility period.

Candidates may only seek reassessment in a previously failed Unit.

5. Syllabus

Study and Communication Skills

Title:	Study and Communication Skills

RQF code:	A/504/1424	**Credits**	20	**Level**	3

Guided Learning Hours	75 hours	**Total Qualification Time**	200 hours

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Be able to take effective notes from a variety of sources	1.1 Identify key information from a range of different texts 1.2 Record key points when listening to information being given 1.3 Critically review their own notes 1.4 Use their own notes to accurately summarise information given 1.5 Use their own notes to present a summary to others 1.6 Demonstrate using a range of sources to gather information
2. Understand how to work out the meaning of unfamiliar content	2.1 Identify unfamiliar content 2.2 Identify a number of different strategies for working out the meaning of unfamiliar content 2.3 Demonstrate the ability to find the meaning of unfamiliar content 2.4 Demonstrate the application of own understanding to unfamiliar content
3. Understand common steps in producing academic work	3.1 Describe the common steps in producing academic work 3.2 Define plagiarism 3.3 Explain correct referencing in an academic essay
4. Be able to produce a piece of academic work suitable for this level, following a drafting process	4.1 Create a timetabled plan to meet the requirements of an academic assignment 4.2 Check own work for errors 4.3 Evaluate own work against criteria/requirements given 4.4 Develop sections of an assignment towards a final draft 4.5 Demonstrate the correct use of academic referencing 4.6 Present a completed piece of academic work to

	others
5. Understand different learning styles	5.1 Explain the idea of multiple intelligences 5.2 Describe a range of learning styles 5.3 Identify own preferred learning style 5.4 Identify own study strengthes and weaknesses

Syllabus Content	
Topic	**Course Coverage**
Learning to Learn	• Learner styles and multiple intelligences • Self study methodology • Time management • Goal setting • Self analysis and critical reflection • Keeping a learner diary ***Learning outcome: 5***
Reading Textbooks and Note Taking	• Reading a textbook & note taking skills • Using notes to write summaries • Public Speaking skills & Peer assessment • Learner diaries and study skills self-assessment ***Learning outcomes: 1,4***
Note Taking in Lectures	• Note taking in lectures • Recognising key points • Guessing meaning • Editing and reviewing notes • Planning a speech • Public speaking practice and assessment ***Learning outcomes: 1,2***
Library Research and Writing an Essay	• Accessing the library and reading strategies • Note taking from books • Essay planning and organising notes • Public speaking practice and assessment ***Learning outcomes: 1,4***
Journal-based Research for Essay Writing	• Journals and articles • Critical reading and analyzing data • Describing data in an essay • Academic Style • Editing and proof reading • Public speaking practice and assessment ***Learning outcome: 4***
Internet Research for Essay Writing	• Using the internet for research • Bibliographies and referencing • Plagiarism and paraphrasing

	• Editing and checking work against criteria • Including sufficient detail • Public speaking practice and assessment ***Learning outcomes: 1,4***
Writing a Research Report	• Approaching a task and making an assignment strategy • Understanding requirements and using criteria • Integrating evidence into a report • Editing and proof reading • Public speaking practice and assessment ***Learning outcome: 3,4***
Examinations and Assessment	• Writing summaries and reviewing notes • Preparing for exams • Time Management • Stress and anxiety management ***Learning outcome: 1***

Related National Occupational Standards (NOS)
Sector Subject Area: IT Users 6.2 **Related NOS:** ESKIICF2 FSI2:2 Access, search for, select and use Internet-based information and evaluate its fitness for purpose ESKIINT3 P8-10 Use browser tools to search effectively and efficiently for information from the Internet **Sector Subject Area:** Business and Administration (2013) **Related NOS:** CFABAA617 Develop a presentation CFABAA623 Deliver a presentation CFASAD111 Plan and manage own workload

Assessment Type
Global Assignment (100%) The assignment is broken into three sections as follows: • Learner Portfolio • Note-taking and summary writing assignment • Research project
See also Section 3 above

Foundation Mathematics

Title:	Foundation Mathematics

RQF code:	F/615/0154	**Credits**	10	**Level**	3

Guided Learning Hours	50 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Be able to perform a range of algebraic calculations	1.1 Simplify a range of algebraic expressions involving powers 1.2 Simplify algebraic expressions by multiplying and dividing expressions 1.3 Factorise algebraic expressions using a range of techniques 1.4 Simplify and solve Algebraic Fractions
2. Be able to solve a range of basic Calculations equations	2.1 Transpose formulae 2.2 Solve linear and quadratic equations 2.3 Solve simultaneous equations 2.4 Perform statistical calculations relating to central tendency
3. Be able to present data in graphical form	3.1 Present data using tables, pie charts and bar charts 3.2 Construct frequency distributions 3.3 Present data as histograms, ogives and time series graphs 3.4 Present linear and quadratic equations in graphical form 3.5 Provide graphical solutions to simultaneous equations
4. Understand the fundamentals of Differential Calculus	4.1 Explain the rate of change of one variable in respect of another 4.2 Calculate the gradient of a curve using differentiation 4.3 Plot maximum and minimum turning points using graphs 4.4 Identify the maximum and minimum turning points using differentiation
5. Understand the fundamentals of Integral Calculus	5.1 Recognise integration as the inverse of differentiation 5.2 Recognise the constant of integration 5.3 Evaluate the constant of integration 5.4 Evaluate the definite integral 5.5 Calculate of the area under a curve

6. Understand Measures of Dispersion	6.1 Calculate the range, quartiles and quantiles 6.2 Calculate the mean deviation 6.3 Calculate the variance 6.4 Calculate the standard deviation
7. Understand the fundamentals of Probability	7.1 Calculate probability using the addition and multiplication rules 7.2 Calculate the probability of compound events 7.3 Use tree diagrams to determine probability 7.4 Calculate probabilities of permutations and combinations

Syllabus Content	
Topic	**Course coverage**
Introduction to Algebra	• Simplification of a range of algebraic expressions including those involving powers • Simplifying a range of algebraic expressions by multiplying and dividing expressions • Factorising algebraic expressions by using a range of techniques • Simplify and solve a range of Algebraic Fractions ***Learning Outcome: 1***
Using Algebraic Equations	• Transposing formulae • Solving simple linear equations • Solving simple quadratic equations • Solving simultaneous equations ***Learning Outcome: 2***
Solving algebraic equations Using Graphs	• Presenting a range of linear equations in graphical form • Presenting a range of quadratic equations in graphical form • Solving simultaneous equations using graphical forms ***Learning Outcome: 3***
Introduction to Differential Calculus	• Using the principles of calculus to explain the rate of change of one variable in respect of another • Calculation of the gradient of a curve using differentiation • Plotting maximum and minimum turning points using graphical means • Identification of the maximum and minimum turning points using differentiation ***Learning Outcome: 4***

Introduction to Integral Calculus	• Recognising the process of integration as the inverse of differentiation • Recognition of the role played by the constant of integration • Evaluation of the constant of integration • Evaluation of the definite integral • Calculation of the area under a curve ***Learning Outcome: 5***
Presentation of Data	• Present data using tables, pie charts and bar charts • Construct Frequency distributions • Present data as histograms, ogives and time series graphs ***Learning Outcome: 3***
Beginning Statistics	• Calculation of the arithmetic mean for a range of data samples • Calculation of the arithmetic mean for a range of frequency distributions • Calculation of the arithmetic mean for grouped data • Calculation of the modal value of data sets • Calculation of the median value of data sets ***Learning Outcomes: 2***
Understanding Dispersion	• Calculation of the range, quartiles and quantiles • Calculation the mean deviation • Calculation of the variance • Calculation of the standard deviation ***Learning Outcome: 6***

Assessments
Global Examination (100%)
See also Section 3 above

Culture Studies

Title:	Culture Studies

RQF code:	J/615/0155	**Credits**	10	**Level**	3

Guided Learning Hours	55 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand the concept of culture, cultural values and how different cultures can be defined	1.1 Explain the terms 'culture' and 'subculture' 1.2 Identify a range of cultural practices and values and their unique aspects 1.3 Explain what is meant by a 'stereotype'
2. Understand how the political and education system of a foreign country differs from their own	2.1 Explain the general organisational structure of the education and political systems of a particular city or country 2.2 Demonstrate understanding of the application and enrolment process for studying abroad
3. Understand how the business culture of a foreign country differs from their own	3.1 Identify variances in work culture and management stuctures 3.2 Describe the benefits of cultural diversity for an organisation 3.3 Assess how cultural factors impact on communication and effective working practices
4. Understand the relationship between digital technologies, communication and culture	4.1 Understand how life online has impacted how people communicate 4.2 Explain the impact of social media, online retail and online news on culture 4.3 Understand aspects of digital culture. 4.4 Explain the ways in which digital technologies have impacted on the individual and society.

Syllabus Content	
Topic	**Course coverage**
What is Culture?	• Definition of culture • Aspects of culture • Personal Cultural Identity • Cultural Practice and unique aspects ***Learning Outcome: 1***
Subcultures	• Definition of subculture • Aspects of subcultures • Comparisons between different cultural aspects • Stereotypes ***Learning Outcome: 1,3***
Government	• Basic types of political system • Police and Crime ***Learning Outcome: 1,3***
Values	• Personal, familial and societal values • Common etiquette in different countries • Common pastimes and the values associated with these ***Learning Outcome: 1, 3, 4***
Education Systems	• Different stages of education systems at home and abroad • Identifying universities in different places ***Learning Outcome: 1, 2***
Application to Higher Education	• Courses, subjects and methods of assessment at chosen universities • The university application process • Personal statements ***Learning Outcome: 2***
Work	• Understanding different attitudes to work • Work culture; organisational and management structures • Cultural differences in international business • Benefits of cultural diversity to an organisation ***Learning Outcome: 1,3***
Digital Culture	• Understanding social media, online retail and online news and its impact on culture • Digital culture and disparity in access • Positives/ negatives of life online on the individual • Positives/ negatives of life online on society ***Learning Outcome: 1, 4***

Assessments
Global Assignment (100%)
See also Section 3 above

Introduction to Computer Science

Title:	Introduction to Computer Science

RQF code:	F/504/0727	**Credits**	10	**Level**	3

Guided Learning Hours	56 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Understand fundamental concepts relating to hardware and software	1.1 Describe the functions of a computer system 1.2 Describe a range of computer systems or justify the use of a type of computer system for a particular purpose 1.3 Define the term 'hardware' 1.4 Describe the purpose or characteristics of computer hardware 1.5 Define the term 'software' 1.6 Identify categories of software 1.7 Describe types of application software or justify the use of application software for a particular purpose 1.8 Describe types of system software or justify the use of system software for a particular purpose 1.9 Describe types of utility software or justify the use of utility software for a particular purpose
2. Understand the characteristics of hardware components	2.1 Describe internal components of computer hardware 2.2 Describe the components of a central processing unit (CPU) 2.3 Describe the functions of a CPU 2.4 Explain the function of the fetch-decode-execute cycle 2.5 Describe how hardware components communicate with each other 2.6 Identify units of measurements of computer storage 2.7 Describe a range of computer storage media or justify the use of a type of storage media for a particular purpose 2.8 Describe a range of input devices or justify the use of a type of input device for a particular purpose 2.9 Describe a range of output devices or justify the use of an output device for a particular purpose

3. Understand how data is represented in a computer system	3.1 Describe how data is represented by binary 3.2 Describe how data is represented by ASCII 3.3 Describe how data is represented by Unicode 3.4 Explain how encryption can be used to represent data 3.5 Explain how compression can facilitate the storage and transmission of data 3.6 Explain the purpose of number systems 3.7 Explain the binary number system 3.8 Demonstrate addition or subtraction of binary numbers 3.9 Demonstrate an understanding of two's complement 3.10 Explain the hexadecimal number system 3.11 Demonstrate conversion between decimal, binary or hexadecimal numbers 3.12 Describe how images are represented in a computer system 3.13 Describe how sound is represented in a computer system 3.14 Explain how compression can facilitate storage and transmission of images or sound 3.15 Define the term 'digital logic' 3.16 Explain the purpose and operation of logic gates
4. Understand the fundamental concepts of computer networks	4.1 Explain the purpose of a computer network 4.2 Describe types of computer network or explain the criteria for selecting a particular type of network 4.3 Describe the hardware used in a computer network 4.4 Describe the software used in a computer network 4.5 Describe the transmission media used in a computer network 4.6 Describe types of network transmission protocols 4.7 Describe types of computer network topology or justify the use of a topology for a particular purpose 4.8 Describe Internet and World Wide Web technologies 4.9 Discuss computer network issues
5. Understand cultural, ethical and legal issues relating to computing	5.1 Explain what a cultural issue is 5.2 Describe a range of cultural issues 5.3 Explain how cultural issues can be addressed 5.4 Explain what an ethical issue is

	5.5 Describe a range of ethical issues 5.6 Explain how ethical issues can be addressed 5.7 Identify laws and guidelines that relate to computing 5.8 Describe situations where laws and guidelines have been used to deal with people using computers to commit crimes or cause offence

Syllabus Content	
Topic	**Course Coverage**
Introduction to Computer Systems and Hardware	• Definition of computer system • Functions of a computer system • Data and information • An overview of a typical computer system • Types of computer systems • Big data • The Internet of Things • Definition of hardware • The role of computer hardware • Types of computer hardware • Accessibility **Learning Outcome: 1**
Introduction to Application Software and System Software	• Definition of software • Categories of software • Software compatibility • Types and uses of application software • How to obtain software • Software licences • Criteria to consider when selecting application software • System software - operating system software - utility software - driver software • Criteria to consider when selecting system software **Learning Outcome: 1**

Internal Components of Computer Hardware	• Internal components: Motherboard, chips, central processing unit (CPU), clock, memory, chipset, expansion slots and cards, power supply, fan, buses, connectors • How components communicate with each other • How components communicate with external devices **Learning Outcomes: 2**
Computer Processors	• The role of a computer processor • Types of processor • Components of a CPU • The functions of a CPU • How components of a CPU communicate with each other • The fetch-execute-decode cycle **Learning Outcome: 2**
Storage Devices and Input and Output Devices	• Computer storage • Units of measurement of computer storage • Computer storage media • Storage locations • Criteria to consider when selecting computer storage • Input devices • Criteria to consider when selecting input devices • Output devices: • Criteria to consider when selecting output devices **Learning Outcome: 2**
Data Representation	• Binary representation of data • ASCII representation of data • Unicode representation of data • Hexadecimal representation of data • Definitions of encryption and decryption • Examples of encryption • Definition of compression • Compression of data **Learning Outcome: 3**

Number Representation	• Number systems • Decimal number system • Binary number system • Why consider number systems? • Addition of binary numbers • Subtraction of binary numbers • Two's complement • Hexadecimal number system • Converting decimal, binary and hexadecimal numbers **Learning Outcome: 3**
Image and Sound Representation	• Image representation • Image file formats • Compression of images • Sound representation • Sound file formats • Compression of sound **Learning Outcome: 3**
Digital Logic	• Digital logic • Truth Tables • Logic gates - AND - OR - NOT - NAND - NOR **Learning Outcome: 3**
Computer Networks	• Definition of a computer network • Types of network • Criteria for selecting a network • Network hardware • Network transmission media • Network transmission protocols • Network software **Learning Outcome: 4**

Network Topologies and the Internet	• Define a network topology • Types of topology • Criteria for selecting a topology • Definition of the Internet • Definition of the World Wide Web (WWW) • World Wide Web technologies • Computer network issues **Learning Outcome: 4**
Cultural, Ethical and Legal Issues Relating to Computing	• Definition of cultural issues • Examples of cultural issues • Addressing cultural issues • Definition of ethical issues • Examples of ethical issues • Addressing ethical issues • UK laws and guidelines - Data Protection Act (1998) - Computer Misuse Act (1990) - Copyright, Designs and Patents Act (1988) • Global laws and computers • Examples of situations where the law has been applied **Learning Outcome: 5**

Related National Occupational Standards (NOS)
Sector Subject Area: IT Users **Related NOS:** ESKITU080, ESKIDMS1 P1-5, Enter, edit and organise structured information in a database ESKIDB1 P6-7 Use database software tools to extract information and produce reports ESKIDB2 P8-11 Use database software tools to run queries and produce reports ESKIDB3 P1-4 Plan, create and modify relational database tables to meet requirements ESKIDMS2 P1-5 Enter, edit and maintain data records in a data management system ESKIDMS1 P6-7 Retrieve and display data records to meet requirements ESKIDMS1 P1-5 Enter, edit and maintain data records in a data management system **Sector Subject Area:** IT and Telecoms **Related NOS:** ESKITP4062 P5-7 Document specified information relating to human interaction and interface (HCI) design

Assessments
Global Examination (100%)
See also Section 3 above

Introduction to Programming

Title:	Introduction to Programming

RQF code:	A/504/0967	**Credits**	10	**Level**	3

Guided Learning Hours	50 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Create project documentation.	1.1 Understand why the design, implementation and testing of a program should be supported by appropriate documentation 1.2 Create and complete a Project Control Object Definition Sheet
2. Implement a program that uses data capture and validation.	2.1 Write a working program which accepts and stores user input 2.2 Write a working program which validates user input and only accepts expected values
3. Implement a program that uses sequential programming with different data types.	3.1 Write a working program that uses sequential programming 3.2 Write a working program which makes use of at least two different data types
4. Implement a program that uses iteration and selection constructs.	4.1 Write a working program that uses a for loop construct. 4.2 Write a working program that uses an if – else construct 4.3 Identify and document appropriate testing of loops and selection statements
5. Implement a program that uses file i/o.	5.1 Write code that demonstrates how to output data to an external file. 5.2 Write code that demonstrates how to read in and store data from an external file. 5.3 Identify and document appropriate testing of file input/ output
6. Implement a program that uses arrays	6.1 Write code that demonstrates how to declare an array 6.2 Write code that demonstrates how to manipulate an array 6.3 Write code that demonstrates how to sort an array 6.4 Identify and document appropriate testing of arrays

Syllabus Content	
Topic	**Course Coverage**
Introduction to the IDE, VB Properties and creating a GUI	• Introduction to Visual Studio Community 2015 IDE • Introduction to GUI objects and properties • Introduction to creating a GUI ***Learning Outcome: 2***
Introduction to data types and sequential programming	• Introduction to programming • Introduction to objects • Introduction to variables • Assignment statements • Introduction to data types • Arithmetic operations ***Learning Outcome: 3***
Introduction to the programming construct of iteration and fixed loops	• Introduction to iteration • Flow of execution • For loop structure • Variables and loops • Nested loops ***Learning Outcome: 4***
Introduction to the programming construct of selection	• If statement structure • Comparison operators • If-Else structure • If – Else – If structure • Compound conditionals • Switch statements ***Learning Outcomes: 2, 4***

Introduction to conditional loops and data validation	• Importance of data validation • Checking for specific values • Checking for a range of values • String comparisons • While loop structure • Logical comparisons • Multiple conditions • Do - While loops ***Learning Outcomes: 2, 4***
Project Definition and Design	• Specification, design, implementation, test cycle • Project Brief to Specification • Object Definition Sheets • Debugging and testing ***Learning Outcome: 1***
Case Study: Creating a GUI program that uses sequence, selection and iteration	• Consolidation of learning from topics 1 – 6 • Student mid-course assignment ***Learning Outcomes: 1, 2, 3, 4***
Introduction to Arrays	• Benefits of arrays • Declaring arrays • Initialising and filling arrays • Accessing and changing values in arrays • Manipulating arrays using for loops • Sorting arrays ***Learning Outcomes: 4, 6***
Introduction to Methods	• Different method types in VB (Subs and Functions) and scope • Parameter passing • Return statements • Method overloading ***Learning Outcomes: 2, 3, 4, 5, 6***
Introduction to File I/O	• Files and data storage • Writing to files • Reading from files • Exception handling for file I/O ***Learning Outcome: 5***

Case Study: Creating a GUI program that uses arrays, procedures and file I/O	• Consolidation of learning from topics 1 – 10 • Student end of course exam ***Learning Outcomes: 1, 2, 3, 4, 5, 6***

Related National Occupational Standards (NOS)
Sector Subject Area: IT and Telecoms **Related NOS:** ESKITP5013 P1-6 - Carry out system development activities under direction; ESKITP5014v2 P1-5 - Perform systems development activities; ESKITP5014v2 P6-10 - Contribute to the management of systems development; ESKITP5022 P1-7- Perform specified software development activities; ESKITP5024 P6-12 - Perform software development activities; ESKITP5033 P1-5 - Carry out IT/Technology solution testing activities under direction; ESKITP5034 P1-4 - Carry out IT/Technology solution testing

Assessment
Global Assignment (100%)
See also Section 3 above

6. Results and Certificates

The grade descriptors Pass, Merit and Distinction are awarded by Unit to successful candidates. A Pass is awarded for an overall Unit mark of between 40 and 59. A Merit is awarded for an overall Unit mark of between 60 and 69 and a Distinction is awarded for an overall Unit mark of 70 and above. Candidates who obtain an overall Unit mark of below 40 are classed as *failed* in the Unit and may resit (see *Section 5.6* above).

A final qualification mark will be awarded upon successful completion of all units. This is calculated by finding the average mark of all units that make up the qualification. Please note that in exceptional circumstances, NCC Education may be required to change the algorithm to calculate a final qualification mark for a learner in order to secure the maintenance of standards over time. Any necessary changes to this algorithm would be shared with Centres and learners promptly by NCC Education. An example is given below:

Unit	Unit Points	Candidate Mark	Unit Points * Candidate Mark
Introduction to Computer Science	10	86	860
Introduction to Programming	10	72	720
Culture Studies	10	81	810
Foundation Mathematics	10	88	880
Study and Communication Skills	20	93	1860
	60	**420**	**5130**
			5130/potential 6000 = 86

Grade Descriptors incorporate characteristics intended to provide a general indication of assessment performance in relation to each Unit's Learning Outcomes in this specification. The final Unit grade awarded will depend on the extent to which a candidate has satisfied the Assessment Criteria. A qualification is awarded when the candidate has achieved at least a pass in all Units.

After each assessment cycle, results slips are issued (in electronic format) which detail the grades achieved, i.e. Fail, Pass, Merit or Distinction (see *Appendix 2*). Certificates which contain your qualification grade and pass mark are then dispatched to Centres.

7. Further Information

For more information about any of NCC Education's products please contact customer.service@nccedu.com or alternatively please visit www.nccedu.com to find out more about our suite of high-quality British qualifications.

Appendix 1 Qualification Documentation

The following NCC Education documentation has been referred to in this specification:

- Reasonable Adjustments and Special Considerations Policy
- Examination Guidelines
- Moderation Manual
- Activity Schedule
- Operations Manual

All documentation, together with access to NCC Education's online resources, is available to Centres and (where applicable) candidates who have registered for assessment.

Appendix 2 Grade Descriptors

The grade descriptors Pass, Merit and Distinction are awarded to successful candidates. The following are characteristics intended to provide a general indication of assessment performance in relation to each Learning Outcome in this specification. The final grade awarded will depend on the extent to which a candidate has satisfied the Assessment Criteria overall.

Grade descriptors for Introduction to Programming

Learning Outcome	Pass	Merit	Distinction
Create project documentation.	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Implement a program that uses data capture and validation.	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Implement a program that uses sequential programming with different data types.	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Implement a program that uses iteration and selection constructs.	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Implement a program that uses file i/o.	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Implement a program that uses arrays	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard

Grade descriptors for Introduction to Computer Science

Learning Outcome	Pass	Merit	Distinction
Understand fundamental concepts relating to hardware and software	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the characteristics of hardware components	Demonstrate adequate ability to differentiate and recognise components	Demonstrate sound and consistent ability to differentiate and recognise components	Demonstrate exceptional ability to differentiate and recognise components
Understand how data is represented in a computer system	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the fundamental concepts of computer networks	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand cultural, ethical and legal issues relating to computing	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding

Grade descriptors for Culture Studies

Learning Outcome	Pass	Merit	Distinction
Understand the concept of culture, cultural values and how different cultures can be defined	Provides consistent interpretation and evaluation of relevant information and ideas to complete tasks and address well defined problems. Demonstrates adequate ability to review effectiveness of methods, actions and results Can adequately identify, select and use appropriate skills, methods and procedures to reach appropriate solutions	Provides critical interpretation and evaluation of relevant information and ideas to complete tasks and address well defined problems. Demonstrates sound ability to review effectiveness of methods, actions and results Can soundly identify, select and use appropriate skills, methods and procedures to reach well explained and appropriate	Provides consistently critical interpretation and evaluation of relevant information and ideas to complete tasks and address well defined problems. Demonstrates comprehensive ability to review effectiveness of methods, actions and results Can coherently identify, select and use appropriate skills, methods and procedures to reach well explained and highly appropriate solutions
Understand how the political and education system of a foreign country differs from their own			
Understand how the business culture of a			

foreign country differs from their own	Has adequate awareness of different perspectives or approaches in the area of study Uses appropriate investigation to inform actions/ conclusions	solutions Has sound awareness of different perspectives or approaches in the area of study Uses detailed investigation to inform actions/ conclusions	Has comprehensive awareness of different perspectives or approaches in the area of study Uses thorough and detailed investigation to inform well explained actions/ conclusions
Understand the relationship between digitial technologies, communication and culture			

Grade descriptors for Foundation Mathematics

Learning Outcome	Pass	Merit	Distinction
Be able to perform a range of algebraic calculations	Demonstrate ability to perform calculations	Demonstrate ability to perform calculations consistently well	Demonstrate ability to perform all calculations to the highest standard
Be able to solve a range of basic Calculations equations	Demonstrate ability to perform techniques	Demonstrate ability to perform techniques consistently well	Demonstrate ability to perform techniques to the highest standard
Be able to present data in graphical form	Demonstrate ability to perform techniques	Demonstrate ability to perform techniques consistently well	Demonstrate ability to perform techniques to the highest standard
Understand the fundamentals of Differential Calculus	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand the fundamental of Integral Calculus	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand Measures of Dispersion	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand the fundamentals of Probability	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques

Grade descriptors for Study and Communication Skills

Learning Outcome	Pass	Merit	Distinction
Be able to take effective notes from a variety of sources	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Understand how to work out the meaning of unfamiliar content	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand common steps in producing academic work	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Be able to produce a piece of academic work suitable for this level, following a drafting process	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Understand different learning styles	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding