Qualification Specification for:

OCN NI Level 4 Diploma in Software Development

- **Qualification No: xxx/xxxx/x**

Qualification Regulation Information

OCN NI Level 4 Diploma in Software Development
Qualification Number: 601/8205/2

Operational start date: 01 January 2016
Operational end date: 01 January 2029
Certification end date: 01 January 2033

Qualification operational start and end dates indicate the lifecycle of a regulated qualification. The operational end date is the last date by which learners can be registered on a qualification and the certification end date is the last date by which learners can claim their certificate.

All OCN NI regulated qualifications are published to the Register of Regulated Qualifications (**http://register.ofqual.gov.uk/**). This site shows the qualifications and awarding organisations regulated by CCEA Regulation and Ofqual.

OCN NI Contact Details

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Foreword

This document explains OCN NI's requirements for the delivery and assessment of the following regulated qualification:

→ **OCN NI Level 4 Diploma in Software Development**

This specification sets out:

- Qualification features
- Centre requirements for delivering and assessing the qualification
- The structure and content of the qualification
- Unit details
- Assessment requirements for the qualification
- OCN NI's quality assurance arrangements for the qualification
- Administration

OCN NI will notify centres in writing of any major changes to this specification. We will also publish changes on our website at **www.ocnni.org.uk**

This specification is provided online, so the version available on our website is the most up to date publication. It is important to note that copies of the specification that have been downloaded and printed may be different from this authoritative online version.

Contents

About Regulation

OCN NI

Open College Network Northern Ireland (OCN NI) is a regulated Awarding Organisation based in Northern Ireland. OCN NI is regulated by CCEA Regulation to develop and award professional and technical (vocational) qualifications from Entry Level up to and including Level 5 across all sector areas. In addition, OCN NI is regulated by Ofqual to award similar qualification types in England.

The Regulated Qualifications Framework: an overview

The Regulated Qualifications Framework (RQF) was introduced on 1st October 2015: the RQF provides a single framework for all regulated qualifications.

Qualification Level

The level indicates the difficulty and complexity of the knowledge and skills associated with any qualification. There are eight levels (Levels 1-8) supported by three 'entry' levels (Entry 1-3).

Qualification Size

Size refers to the estimated total amount of time it could typically take to study and be assessed for a qualification. Size is expressed in terms of Total Qualification Time (TQT), and the part of that time typically spent being taught or supervised, rather than studying alone, is known as Guided Learning Hours (GLH).

Qualification Features

Qualification Aim/Objectives

The OCN NI Level 4 Diploma in Software Development qualification provides skills in software/object oriented programming and software testing/ administration. It has been designed to meet academic and professional standards and the needs of industry/employers and will accommodate a diverse range of learners. The qualification will help ensure more people have the employability skills to support the high percentage of vacancies in IT related occupations.

Sector Subject Area

6.1 ICT for Practitioners

Grading

Grading for this qualification is pass/fail.

Qualification Target Group

The qualification is targeted at learners who have reached a certain level of skills and knowledge in the area of software development and would benefit from achieving a qualification as this would enhance their employment opportunities.

Progression Opportunities

The OCN NI Level 4 Diploma in Software Development qualification enables progression into further learning in this area or into employment.

Entry Requirements

Learners will be expected to have reached a suitable level of skills and knowledge in the area of software development to be able to cope with a level 4 programme. No former specific qualification is required however learners must be at least 16 years old.

Qualification Support

A Qualification Support pack is available for OCN NI centres within the login area of the OCN NI website (https://www.ocnni.org.uk/my-account/), which includes additional support for teachers, eg planning and assessment templates, guides to best practice, etc.

Delivery Languages

This qualification is available in English only at this time. If you wish to offer this qualification in Welsh or Irish (Gaeilge) then please contact OCN NI who will review demand and provide as appropriate.

Centre Requirements for Delivering the Qualification

Centre Recognition and Qualification Approval

New and existing OCN NI recognised centres must apply for and be granted approval to deliver the qualification prior to the commencement of delivery.

Centre Staffing

Centres are required to have the following roles in place as a minimum, although a member of staff may hold more than one role*:

- Centre contact
- Programme Co-ordinator
- Tutor
- Assessor
- Internal Verifier

*Note: A person cannot be an internal verifier for their own assessments.

Tutors

Tutors delivering the qualification should be occupationally competent at a higher level than the qualification and have appropriate experience in the software development area.

Assessors

The qualifications are assessed within the centre and are subject to OCN NI's quality assurance processes. Units are achieved through internally set, internally assessed, and internally verified evidence.

Assessors must:

- be occupationally competent and qualified to at least one level higher than the qualification and have appropriate experience in the area of software development
- have a minimum of one year's relevant experience in the area they are assessing
- have direct or related relevant experience in assessment
- assess all assessment tasks and activities

Internal Verification

OCN NI qualifications must be scrutinised through the centre's internal quality assurance processes as part of the recognised centre agreement with OCN NI. The centre must appoint an experienced and trained centre internal verifier whose responsibility is to act as the internal quality monitor for the verification of the delivery and assessment of the qualifications.

The centre must agree a working model for internal verification with OCN NI prior to delivery of the qualifications.

Internal Verifiers must:

- have at least one year's occupational experience in the areas they are internally verifying
- attend OCN NI's internal verifier training if not already completed

Internal verifiers are required to:

- support tutors and assessors
- sample assessments according to the centre's sampling strategy
- ensure tasks are appropriate to the level being assessed
- maintain up-to-date records supporting the verification of assessment and learner achievement

Structure and Content

The table below summarises the structure of this qualification. There is one mandatory unit and a choice of 2 units from 3 optional units - a total of 37 credits.

Total Qualification Time (TQT) for this qualification: 370 hours
Guided Learning Hours (GLH) for this qualification: 275 hours

Unit Reference Number	OCN NI Unit Code	Unit Title	TQT	Credit Value	Level
Mandatory Unit					
F/505/9861	CAY870	Object Oriented Programming in C#	130	13	Four
Optional Units					
L/505/9863	CAY871	Software Programming	120	12	Four
J/505/9862	CAY872	Software Testing & Administration	120	12	Four
T/507/9587	CBD295	Databases	120	12	Four

Unit Details

Title	Object Oriented Programming in C#
Level	Four
Credit Value	13
Guided Learning Hours (GLH)	95
OCN NI Unit Code	CAY870
Unit Reference No	F/505/9861
Unit purpose and aim(s): This unit will enable the learner to design and implement object orientated computer programs in C#.	

Learning Outcomes	Assessment Criteria
1. Understand the principles of Object Oriented programming in C#	1.1. Explain the principles, characteristics and features of Object Oriented Programming. 1.2. Critically evaluate the environment flexibility of programming in C#.
2. Design Object Oriented programming solutions in C#.	2.1. Select and justify choice of objects and data file structures required to implement a given design. 2.2. Design an Object Oriented Programming solution to a given problem.
3. Be able to implement Object Oriented programming solution in C#.	3.1. Use Object Oriented programming in C# to create a solution based on a prepared design. 3.2. Clarify relationships between objects to implement design requirements. 3.3. Use Object behaviours using Control Structures to meet design algorithms. 3.4. Use an integrated Development Environment (IDE), including coding and screen templates. 3.5. Demonstrate how to implement error handling and reporting.
4. Be able to test and document Object Oriented Programming solutions in C#.	4.1. Critically evaluate an Object Orientated Programming solution. 4.2. Analyse test results against expected results to identify possible discrepancies. 4.3. Evaluate feedback on a developed Object Orientated Programming solution and make recommendations for improvements. 4.4. Create onscreen help to assist the users of a computer program. 4.5. Create user documentation to assist with support and maintenance of a computer program.

Assessment Guidance

The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.

Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as	Learner notes/written work Learner log/diary Peer notes

	evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log
Coursework	Research or projects that count towards a learner's final outcome and demonstrate the skills and/or knowledge gained throughout the course	Record of observation Learner notes/written work Tutor notes/record Learner log/diary

Title	Software Programming
Level	Four
Credit Value	12
Guided Learning Hours (GLH)	90
OCN NI Unit Code	CAY871
Unit Reference No	L/505/9863
Unit purpose and aim(s): This unit will enable the learner to understand the principals and use of programming languages to produce computer programs.	

Learning Outcomes	Assessment Criteria
1. Understand the differences between common programming languages	1.1. Critically compare interpreted and compiled languages. 1.2. Evaluate the suitability of a language for a task based on its design and available library.
2. Understand the similarities between common programming languages.	2.1. Critically compare common data structures. 2.2. Explain and develop algorithms for given tasks. 2.3. Critically compare recursion and iteration.
3. Understand operating systems	3.1. Explain the functions of an operating system. 3.2. Evaluate programming languages used in operating systems. 3.3. Demonstrate the use of programming languages used in operating systems.
4. Be able to use software design techniques	4.1. Explain the concepts of formal design methodologies. 4.2. Develop designs using formal techniques.
5. Be able to apply programming techniques	5.1. Develop code designs using appropriate programming languages. 5.2. Demonstrate the use of graphics and sound in computer program development.
6. Be able to write object-oriented code.	6.1. Explain the design principals of object-oriented programming. 6.2. Explain the difference between a class and an object. 6.3. Select appropriate class visibility modifiers for attributes and methods.
7. Be able to write event-driven code.	7.1. Justify the use of asynchronous design in Graphic User Interface (GUI) application code. 7.2. Explain the appropriate design Graphic User Interface (GUI) application code (this is usually written to an asynchronous design). 7.3. Explain the different types of events emitted by a GUI.

Assessment Guidance

The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.

Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion

	A collection of documents containing work that shows the learner's progression through the course	
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log
Coursework	Research or projects that count towards a learner's final outcome and demonstrate the skills and/or knowledge gained throughout the course	Record of observation Learner notes/written work Tutor notes/record Learner log/diary

Title	Software Testing
Level	Four
Credit Value	12
Guided Learning Hours (GLH)	90
OCN NI Unit Code	CAY872
Unit Reference No	J/505/9862
Unit purpose and aim(s): This unit will enable the learner to understand how to design and implement software testing plans.	
Learning Outcomes	**Assessment Criteria**
1. Understand the Software Development Lifecycle	1.1. Explain the Software Development Lifecycle. 1.2. Explain the importance of communication skills, project management skills, document creation and associated process and procedures. 1.3. Demonstrate the application of communication skills, project management skills, document creation and associated process and procedures.
2. Understand testing strategies, techniques and management.	2.1. Explain the stages of system testing including alpha, beta, and acceptance testing. 2.2. Explain the contents of a software test plan. 2.3. Explain the purpose of unit, integration and system testing of software. 2.4. Critically compare the application of unit, integration and system testing of software 2.5. Critically compare functional and structural testing techniques and dynamic and static testing.
3. Be able to contribute to a test process for a software solution.	3.1. Select test cases from a software test plan. 3.2. Perform actions specified in test cases and record results. 3.3. Compare and report on actual and expected test results.
4. Be able to design a test strategy.	4.1. Develop software testing strategy, plan and associated activities using appropriate tools. 4.2. Justify the test plan proposition and testing strategy. 4.3. Explain the various methods used to obtain data to test programs. 4.4. Demonstrate the use of various methods to obtain data to test programs.
5. Be able to implement test plans.	5.1. Implement test plan based on the initial coding phase, unit testing and debugging. 5.2. Implement a test plan based on software integration, integration and system testing, debugging and enhancements.
6. Be able to evaluate test plans.	6.1. Critically evaluate the test outcomes. 6.2. Justify the validity of the test and identify any issues with appropriate recommendations

Assessment Guidance		
The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.		
Assessment Method	**Definition**	**Possible Content**
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion
Practical demonstration/assignment	A practical demonstration of a skill/situation selected by the tutor or by learners, to enable learners to practise and apply skills and knowledge	Record of observation Learner notes/written work Learner log
Coursework	Research or projects that count towards a learner's final outcome and demonstrate the skills and/or knowledge gained throughout the course	Record of observation Learner notes/written work Tutor notes/record Learner log/diary

Title	Databases
Level	Four
Credit Value	12
Guided Learning Hours (GLH)	90
OCN NI Unit Code	CBD295
Unit Reference No	T/507/9587
Unit purpose and aim(s): This unit will enable the learner to understand the principles of database design and usage.	

Learning Outcomes	Assessment Criteria
1. Understand database structures and data manipulation.	1.1. Explain the purposes of databases. 1.2. Describe the importance of a primary key. 1.3. Explain the steps required for normalisation.
2. Know a range of data management issues.	2.1. Explain the importance of data security. 2.2. Summarise a range of methods which may be used to protect data. 2.3. Explain the importance of data redundancy.
3. Understand the stages of the database life cycle.	3.1. Illustrate the steps and stages of the database life cycle.
4. Be able to evaluate file-based and relational database systems.	4.1. Critically compare the features and application of file-based and relational database systems.
5. Analyse data relationships and design a database schema.	5.1. Summarise different types of relationships and cardinality. 5.2. Create relationships between tables stating cardinality. 5.3. Create a database scheme based on a given scenario.
6. Design Structured Query Language (SQL) queries of varying complexity.	6.1. Create a series of SQL based queries using one or more criteria to return results. 6.2. Demonstrate how to embed queries into a form to return results into a report format.
7. Know how to design a database.	7.1. Normalise a given table into its smallest normal form. 7.2. Create a data dictionary for a table. 7.3. Create a relational schema for a database.
8. Implement a database within a database management system.	8.1. Create a database based on given scenario within a database management system. 8.2. Create forms and reports for a database. 8.3. Test the database against the initial requirements.

Assessment Guidance

The following assessment method/s may be used to ensure all learning outcomes and assessment criteria are fully covered.:

Assessment Method	Definition	Possible Content
Portfolio of evidence	A collection of documents containing work undertaken to be assessed as evidence to meet required skills outcomes OR A collection of documents containing work that shows the learner's progression through the course	Learner notes/written work Learner log/diary Peer notes Record of observation Record of discussion

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Quality Assurance of Centre Performance

External Verification

All OCN NI recognised centres are subject to External Verification. External verification visits and monitoring activities will be conducted annually to confirm continued compliance with the conditions of recognition, review the centre's risk rating for the qualifications and to assure OCN NI of the maintenance of the integrity of the qualifications.

The External Verifier will review the delivery and assessment of the qualifications. This will include the review of a sample of assessment evidence and evidence of the internal verification of assessment and assessment decisions. This will form the basis of the EV report and will inform OCN NI's annual assessment of centre compliance and risk. The External Verifier is appointed by OCN NI.

Standardisation

As a process, standardisation is designed to ensure consistency and promote good practice in understanding and application of standards. Standardisation events:

- make qualified statements about the level of consistency in assessment across centres delivering a qualification
- make statements on the standard of evidence that is required to meet the assessment criteria for units in a qualification
- make recommendations on assessment practice
- produce advice and guidance for the assessment of units
- identify good practice in assessment and internal verification

Centres offering units of an OCN NI qualification must attend and contribute assessment materials and learner evidence for standardisation events if requested.

OCN NI will notify centres of the nature of sample evidence required for standardisation events (this will include assessment materials, learner evidence and relevant assessor and internal verifier documentation). OCN NI will make standardisation summary reports available and correspond directly with centres regarding event outcomes.

Administration

Registration

A centre must register learners within 20 working days of commencement of a qualification.

Certification

Certificates will be issued to centres within 20 working days of receipt of correctly completed results marksheets. It is the responsibility of the centre to ensure that certificates received from OCN NI are held securely and distributed to learners promptly and securely.

Charges

OCN NI publishes all up to date qualification fees in its Fees and Invoicing Policy document. Further information can be found on the centre login area of the OCN NI website.

Equality, Fairness and Inclusion

OCN NI has considered the requirements of equalities legislation in developing the specification for these qualifications. For further information and guidance relating to access to fair assessment and the OCN NI Reasonable Adjustments and Special Considerations policies, centres should refer to the OCN NI website.

Retention of Evidence

OCN NI has published guidance for centres on the retention of evidence. Details are provided in the OCN NI Centre Handbook and can be accessed via the OCN NI website.

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