CERTIFICATE OF VALIDATION

QQI
Quality and Qualifications Ireland
Dearbhú Cáilíochta agus Cáilíochtaí Éireann

ReValidation

Provider Name	National College of Ireland
Date of Validation	11-Jun-20

	Code	Title	Award	Duration (Full Time)	Duration (Part Time)	Exit
Principal Programme	PG24355	Bachelor of Science (Honours) in Computing	Bachelor of Science (Honours) (Major Award at NFQ Level 8) 8M20953 240 Credits	4 years	4 years	
Embedded Programmes	PG24358	Bachelor of Science in Computing	Bachelor of Science (Major Award at NFQ Level 7) 7M20955 180 Credits	3 years	3 years	Yes
	PG24359	Higher Certificate in Science in Computing	Higher Certificate in Science in Computing (Major Award at NFQ Level 6) 6M20957 120 Credits	2 years	2 years	No

	First intake	Last intake
Enrolment Interval	Sep-20	Aug-25

	Full Time	Part Time
Maximum Intakes per annum:	2	2
Minimum Learners per Intake:	15	15
Maximum Learners per Intake:	130	130

Principal Programme

Target Learner groups

The Bachelor of Science (Hons) in Computing is aimed at full time and part time students. There are a number of different categories of potential students that have been identified as suitable candidates for this course:

•Students who have their Leaving Certificate complete and who wish to pursue a career in ICT;
•Part-time students who are currently working in ICT who don't have the relevant academic experience and are looking for a progression path in their current working environment or are looking to upskill and move to a new job in the field.

Brief Synopsis of the programmes

This programme is a 4-year Bachelor of Science (Hons) degree aimed at Leaving Certificate graduates or mature applicants who wish to follow a career in computing. The programme will run both on part-time and full-time basis in order to cater to the different types of students. The students will have to attend lectures and tutorials in the classroom or online over the academic year, as well as to study independently. Students will study for 4 stages taking modules that cover topics such as Mathematics, Programming, Problem Solving, Data Communications and Networking, Software Quality and Testing, Innovation and Business Entrepreneurship, Security Fundamentals and Development, Cloud Application and Development, Data Governance, Security and Ethics. An important component of the programme will be the 6 months Work Placement in stage 3, as well as the capstone Computing Project in stage 4. The programme leads to a level 8 academic award Bachelor of Science (Hons) in Computing awarded by QQI. Graduates of this programme may pursue further education or employment in the field of computing.

Delivery mode: full-time / part-time

Full-time,Part-time,Online and Blended

Teaching and Learning Modes

Blended learning combining different strategies, including traditional classroom lectures, tutorials and seminars, flipped classroom, problem and project-based learning, team work and work-based learning.
Synchronous Online delivery may also be used in some cases.

Approved countries

Ireland

Physical resource requirements

The programme requires appropriate learning spaces to facilitate the teaching, learning & assessment strategy of the programme. Learning spaces should accommodate traditional classrooms, spaces for collaborative learning and access to appropriate technologies as required by individual module curriculum (e.g., development environments, cloud infrastructure, or similar products). Students must also have access to appropriate personal study space. Access to appropriate recreation and dining spaces are also required.

Staff Profiles

Qualifications and Experience	WTE
Lecturers with a Masters or PhD level qualification in computing or a related discipline with academic experience delivering modules in ICT, Maths and Statistics, Programming, and Data Analytics at level 8.	14
Programme Director who is responsible for the academic management of the programme and may also be a lecturer on the programme. The programme director will have at least a Masters or PhD qualification in computing or a related discipline.	2
Programme Co-ordinators with experience in relationship management and programme co-ordination.	1

Approved Centres

Centre	Minimum per intake per Centre	Maximum per intake per Centre
NCI Main Campus	15	130

Learner Teacher Ratios

Learning Activity	Ratio
Tutorials/Labs	1:25
Lecturers	1:100

Programme being replaced by this programme

Prog Code	Programme Title	Validated	To Close
PG22548	Bachelor of Science (Honours) in Computing	20-Dec-18	

Embedded Programme

Code	Title	Award	Duration (Full Time)	Duration (Part Time)	Exit?
PG24358	Bachelor of Science in Computing	Bachelor of Science 7M20955 180 Credits	3 years	3 years	Yes

	Full Time	Part Time
Maximum Intakes per annum:	N/A	N/A
Minimum Learners per Intake:	N/A	N/A
Maximum Learners per Intake:	N/A	N/A

Target Learner groups

As per the Principal Programme.

Brief Synopsis of the programmes

As per the Principal Programme.

Delivery mode: full-time / part-time

As per the Principal Programme.

Teaching and Learning Modes

As per the Princpal Programme.

Approved countries where enrolled learners will be based

As per the Principal Programme.

Physical resource requirements

As per the Principal Programme.

Staff Profiles

Qualifications and Experience	WTE
As per the Principal Programme.	

Approved Centres

Centre	Minimum per intake per Centre	Maximum per intake per Centre
As per the Principal Programme.	0	0

Learner Teacher Ratios

Learning Activity	Ratio
As per the Principal Programme.	

Programme being replaced by this programme

Prog Code	Programme Title	Validated	To Close
na	n/a		

Embedded Programme

Code	Title	Award	Duration (Full Time)	Duration (Part Time)	Exit?
PG24359	Higher Certificate in Science in Computing	Higher Certificate in Science in Computing 6M20957 120 Credits	2 years	2 years	No

	Full Time	Part Time
Maximum Intakes per annum:	2	2
Minimum Learners per Intake:	15	15
Maximum Learners per Intake:	80	80

Target Learner groups

The Higher Certificate in Science in Computing is aimed at full time and part time learners.
There are a number of different categories of potential learners that have been identified as suitable candidates for this course:
•Learners who have their Leaving Certificate complete and who seek an introduction to Computer Applications with a view to pursuing a career or further education in the field.
•Learners who are currently working in IT or science sectors and don't have the relevant academic experience and are looking for a progression path in their current working environment or are looking to upskill and move to a new job in Computer Applications.
•The award may also serve as an exit award for those learners who successfully complete stages 1 and 2 of the BSc in Computer Science who opt to leave the degree prior to completing the full programme.

Brief Synopsis of the programmes

This programme is a 2-year Higher Certificate programme aimed at Leaving Certificate graduates or mature applicants who wish to follow a career in Computer Application Development. The programme will run both on part-time and full-time basis in order to cater to the different types of learners. The learners will have to attend classroom lectures and tutorials over the academic year, as well as study independently.
Learners will study for 2 stages taking modules that cover topics such as Discrete Mathematics, Problem Solving & Programming, Web Design & Development, Introduction to Programming leading on to Object Oriented Programming and then Data Structures & Algorithms, Digital Multimedia, Computer Architecture, Introduction to Data Modelling & Databases, Data Communications & Networking, Team Project and Software Engineering. The programme leads to a level 6 Higher Certificate in Science in Computing awarded by QQI. Graduates of this programme may pursue further education or employment within the Computing Industry.

Delivery mode: full-time / part-time

Full-time, Part-time, Block and Blended

Teaching and Learning Modes

Blended learning combining different strategies, including traditional classroom lectures, tutorials and seminars, flipped classroom, problem and project-based learning, team work and work-based learning.
Synchronous Online delivery may also be used in some cases.

Approved countries where enrolled learners will be based

Ireland

Physical resource requirements

The programme requires appropriate learning spaces to facilitate the teaching, learning & assessment strategy of the programme. Learning spaces should accommodate traditional classrooms, spaces for collaborative learning and access to appropriate technologies as required by individual module curriculum (e.g., Word, Excel, PowerPoint, Notepad++, TextPad, NetBeans, Workbench & MySQL or similar products).
Students must also have access to appropriate personal study space.
Access to appropriate recreation and dining spaces are also required.

Staff Profiles

Qualifications and Experience	WTE
Lecturers with a Masters or PhD level qualification in computing or a related discipline with academic experience delivering modules in Maths, Programming, and Databases at level 8.	14
Programme Director who is responsible for the academic management of the programme and may also be a lecturer on the programme. The programme director will have at least a Masters or PhD qualification in computing or a related discipline.	1
Programme Co-ordinators with experience in relationship management and programme co-ordination.	1

Approved Centres

Centre	Minimum per intake per Centre	Maximum per intake per Centre
NCI Main Campus	15	80

Learner Teacher Ratios

Learning Activity	Ratio
Tutorials/Labs	1:25
Lectures	1:100

Programme being replaced by this programme

Prog Code	Programme Title	Validated	To Close
PG21859	Higher Certificate in Science in Computing Applications and Support	10-Jun-15	

Conditions of Validation of the Programmes Covered by this Certificate of Validation

Part 1: Statutory Conditions of Validation

The statutory (section 45(3) of the 2012 Act) conditions of validation are that the provider of the programme shall:

1.co-operate with and assist QQI in the performance of QQI's functions in so far as those functions relate to the functions of the provider,
2.establish procedures which are fair and consistent for the assessment of enrolled learners to ensure the standards of knowledge, skill or competence determined by QQI under section 49 (1) are acquired, and where appropriate, demonstrated, by enrolled learners,
3.continue to comply with section 65 of the 2012 Act in respect of arrangements for the protection of enrolled learners, if applicable, and
4.provide to QQI such information as QQI may from time to time require for the purposes of the performance of its functions, including information in respect of completion rates.

Part 2 Conditions of Validation Established by QQI Under section 45(4)(b) of the 2012 Act)

Part 2.1 Condition of Validation Concerning a Change in the QQI Award or Award Standard

1.Where QQI changes an award title, an award specification or an award standard that a programme depends upon, the provider shall not enrol any further learners on the affected programmes unless informed otherwise in writing by QQI (e.g. by the issue of a revised certificate of validation). The programme is considered validated for learners already enrolled on the affected programme.

Part 2.2 Condition of Validation Concerning the Duration of Enrolment

1.The duration of enrolment is the interval during which learners may be enrolled on the validated programme.

Validation is determined by QQI for a specified number of years of enrolment appropriate to the particular programme as indicated on the certificate on validation subject to unit 9.2.1. It is a condition of validation that the programme does not enrol any new learners outside this interval. A typical duration would be five years.

If a provider wishes to continue to enrol learners to the programme beyond this interval the provider must arrange in good time for it to be validated again by QQI, or exceptionally the provider may apply for extension of the duration of enrolment (unit (14)). In this context the provider may apply for validation of the programme from first principles or, alternatively, the provider may avail of the process for revalidation (unit (13)) by QQI.

Part 2.3 General Condition of Validation

The provider of the programme shall:

1.Ensure that the programme as implemented does not differ in a material way from the programme as validated; differing in a material way is defined as differing in any aspect of the programme or its implementation that was material to QQI's validation criteria.
2.Ensure that the programme is provided with the appropriate staff and physical resources as validated.
3.Implement in respect of the programme its written quality assurance procedures (as approved by QQI).
4.Make no significant change to the programme without the prior approval of QQI. (See unit (8)).
5.Unless otherwise agreed by QQI in writing, start implementing the programme as validated and enrol learners within 18 months of validation.

6.Continue in respect of the validated programme to comply with section 56 of the 2012 Act in respect of procedures for access, transfer and progression.
7.Implement the programme and procedures for assessment of learners in accordance with the Approved Programme Schedule and notify QQI in writing of any amendments to this arising from changes to the programme; see unit (9).
8.When advertising and promoting the programme and awards, use the programme title as validated, and the correct QQI award title(s), award type(s) and award class(es) indicating the level of the award(s) on the National Framework of Qualifications.
9.Adhere to QQI regulations and procedures for certification.

10.Notify QQI in writing without delay of:
a. any material change to the programme;
a. anything that impacts on the integrity or reputation of the programme or the corresponding QQI awards;
b. anything that infringes the conditions of validation; or
c. anything that would be likely to cause QQI to consider reviewing the validation.
11.Notify QQI in writing to determine the implications for the provider's validated programmes, where the provider is likely to, or planning to, merge (amalgamate) with another entity or to acquire, or be acquired by, another entity (see unit (12.5)).
12.Report to QQI, when required or requested, on its implementation of the programme and compliance with the conditions of validation.

Part 2.4 General Condition of Validation Arising from Specialised Validation Policy and Criteria

1. n/a

Part 2.5 Special Conditions of Validation

1. n/a

Approved Programme Schedule(s)

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**N/A**
Modes of Delivery (FT/PT):	**Full Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level[2]	Stage EQF Level[2]	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major			1			60	Sept 2020	0613

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number[5]	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level[1] where specified	Credit Units ECTS	Total Hours	Class(orequiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam
Computational Thinking	1	M		5	125	24		101		100			
Web Design & Development	1	M		10	250	72		178		100			
Discrete Mathematics	1	M		5	125	60		65		40			60
Problem Solving & Programming Concepts	1	M		5	125	36		89		100			
The Computing Industry	1	M		5	125	36		89		100			
Computer Architecture	2	M		5	125	36		89		50			50
Introduction to Programming	2	M		5	125	48		77		50		50	
Digital Multimedia	2	M		5	125	48		77		100			
Introduction to Data Modelling and Databases	2	M		10	250	48		202		40			60

Operating Systems	**2**	**M**		**5**	**125**	**36**		**89**		**50**			**50**
Special Regulations (Up to 280 characters)													

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**Higher Certificate in Science in Computing**
Modes of Delivery (FT/PT):	**Full Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level[2]	Stage EQF Level[2]	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	**8**	**6**	**2**	**6**	**5**	**60**	**September 2020**	**0613**

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number[5]	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level[1] where specified	Credit Units ECTS	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Data Communications and Networking	**1**	**M**	**6**	**5**	**125**	**36**		**89**		**40**			**60**
Object Oriented Programming	**1**	**M**	**6**	**5**	**125**	**48**		**77**		**50**		**50**	
Web Application Development	**1**	**M**	**6**	**10**	**250**	**72**		**178**		**100**			
Advanced Databases	**1**	**M**	**6**	**10**	**250**	**48**		**202**		**40**			**60**
Innovation and Business Entrepreneurship	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Data Structures and Algorithms	**2**	**M**	**6**	**10**	**250**	**72**		**178**		**50**		**50**	
Team Project	**2**	**M**	**6**	**5**	**125**	**48**		**77**		**100**			
Software Engineering	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Software Quality and Testing	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Special Regulations (Up to 280 characters)													

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**Bachelor of Science (Ord) in Computing**
Modes of Delivery (FT/PT):	**Full Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level[2]	Stage EQF Level[2]	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	**8**	**6**	**3**	**7**	**6**	**60**	**2020**	**0613**

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number[5]	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level[1] where specified	Credit Units ECTS	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Independent Learning Hours	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Advanced Computer Networks	**1**	**M**	**7**	**5**	**125**	**36**		**89**		**40**			**60**
Security Fundamentals and Development	**1**	**M**	**7**	**10**	**250**	**48**		**202**		**50**			**50**
Introduction to Artificial Intelligence and Machine Learning	**1**	**EA**	**7**	**5**	**125**	**36**		**89**		**50**			**50**
Business and Artificial Intelligence	**1**	**EA**	**7**	**5**	**125**	**36**		**89**		**50**			**50**
Project Management	**1**	**EB**	**7**	**10**	**250**	**48**		**202**		**50**			**50**
Advanced Programming	**1**	**EB**	**7**	**10**	**250**	**72**		**178**		**50**			**50**
Work Placement	**2**	**EC**	**7**	**30**	**750**	**0**			**750**	**100**			**0**
Academic Internship	**2**	**EC**	**7**	**30**	**750**	**168**		**582**		**100**			**0**
Special Regulations (Up to 280 characters)													

Students will have to choose an elective module from Electives A (EA).

Students will have to choose an elective module from Electives B (EB).

Students will have to do an elective module from Electives C (EC), either Work Placement or Academic Internship if they won't secure a work placement in the industry.

Learners may specialise in one of 6 areas in their final year: Software Development; Gaming Programming; Blockchain; Artificial Intelligence/Machine Learning/Data Analytics; Internet of Things; Cybersecurity; and Digital Business Transformation. The choice of the above electives will condition the specialisations that a student can follow afterwards in year 4. As such, the following rules apply:

For all the other specialisations except Digital Business Transformation, students must choose from EB, Advanced Programming module.

Students wishing to specialise in Artificial Intelligence/Machine Learning/Data Analytics or Internet of Things must choose from EA Introduction to Artificial Intelligence and Machine Learning module.

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title	**N/A**
Modes of Delivery (FT/PT):	**Full Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class	Award NFQ level	Award EQF Level	Stage(1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	8	6	Award	8	6	60	September 2020	0613

Module Title(Up to 70 characters including spaces)	Semester no where applicable.(Semester 1 or Semester2)	Module		Credit Number	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level where specified	Credit Units	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Cloud Application Development	1	M	8	10	250	60		190		100			0
IT Governance, Security and Ethics	1	M	8	5	125	36		89		40			60
Business Analysis	1	O	8	10	250	48		202		100			0
Blockchain Foundations	1	O	8	10	250	48		202		40			60

Secure Application Programming	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Game Systems	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
IoT Fundamentals and Development	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**40**			**60**
Artificial Intelligence	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**40**			**60**
Computing Project	**1&2**	**M**	**8**	**20**	**500**	**48**		**452**			**100**		**0**
Data Application Development	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**100**			**0**
Strategic Management	**2**	**O**	**8**	**5**	**125**	**36**		**89**		**30**			**70**
Digital Forensics	**2**	**O**	**8**	**5**	**125**	**36**		**89**		**50**			**50**
IoT Application Development	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**100**			**0**
Machine Learning	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**40**			**60**
Data Mining and Visualisation Principles	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
DevOpsSec	**2**	**O**	**8**	**5**	**123**	**36**		**89**		**100**			**0**
Penetration Testing	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**50**			**50**
Games Programming	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**

Blockchain Application Development 1	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**50**			**50**
Blockchain Application Development 2	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Digital Transformation	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Mixed Reality	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**100**			**0**

Special Regulations (Up to 280 characters)

The Computing Project module is assessed over both semesters in the final year and accounts for 5 credits in semester 1 and 15 credits in semester 2.

As aforementioned, learners may specialise in one of 7 areas in their final year: Software Development; Gaming Programming; Blockchain; Artificial Intelligence/Machine Learning/Data Analytics; Internet of Things; Cybersecurity; and Digital Business Transformation. The choice of specialisation is conditioned by the electives taken in the 3rd year as specified in the Stage 3 Special regulations.

Those wishing to specialise in Software Development must take the following modules: IoT Fundamentals and Development, DevOpsSec and Secure Application Programming. The latter will be a semester 2 module for the Software Development specialization and a semester 1 module for Cybersecurity.

Those wishing to specialise in Cybersecurity must take the following modules: Secure Application Programming, Penetration Testing and Digital Forensics.

Those wishing to specialise in Internet of Things must take the following modules: IoT Fundamentals and Development, IoT Application Development and Data Mining and Visualisation.

Those wishing to specialise in Gaming Programming must take the following modules: Game Systems, Games Programming and Mixed Reality.

Those wishing to specialise in Artificial Intelligence/Machine Learning/Data Analytics must take the following modules: Artificial Intelligence, Data Application Development and Machine Learning.

Those wishing to specialise in Blockchain must take the following modules: Blockchain Foundations, Blockchain Application Development 1 and Blockchain Application Development 2.

Those wishing to specialise in Digital Business Transformation must take the following modules: Business Analysis, Strategic Management and Digital Transformation.

Part-time Programme Schedule(s)

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**N/A**
Modes of Delivery (FT/PT):	**Part Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	Award NFQ level	Award EQF Level	Stage (1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level[2]	Stage EQF Level[2]	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major			**1**			**60**	**Sept 2020**	**0613**

Module Title (Up to 70 characters including spaces)	Semester no where applicable. (Semester 1 or Semester2)	Module		Credit Number [5]	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level[1] where specified	Credit Units	Total Hours	Class(orequiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam
				ECTS									
Computational Thinking	**1**	**M**	**6**	**5**	**125**	**24**		**101**		**100**			
Web Design & Development	**1**	**M**	**6**	**10**	**250**	**72**		**178**		**100**			
Discrete Mathematics	**1**	**M**	**6**	**5**	**125**	**60**		**65**		**40**			**60**
Operating Systems	**1**	**M**	**6**	**5**	**125**	**36**		**89**		**50**			**50**
Computer Architecture	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**50**			**50**
Introduction to Programming	**2**	**M**	**6**	**5**	**125**	**48**		**77**		**50**		**50**	
Introduction to Data Modelling and Databases	**2**	**M**	**6**	**10**	**250**	**48**		**202**		**40**			**60**
Digital Multimedia	**3**	**M**	**6**	**5**	**125**	**48**		**77**		**100**			

Problem Solving & Programming Concepts	**3**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
The Computing Industry	**3**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Special Regulations (Up to 280 characters)													

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**Higher Certificate in Science in Computing**
Modes of Delivery (FT/PT):	**Part Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	**Award NFQ level**	**Award EQF Level**	**Stage (1, 2, 3, 4, …, or Award Stage):**	**Stage NFQ Level[2]**	**Stage EQF Level[2]**	**Stage Credit (ECTS)**	**Date Effective**	**ISCED Subject code**
Major	**8**	**6**	**2**	**6**	**5**	**60**	**September 2020**	**0613**

Module Title (Up to 70 characters including spaces)	**Semester no where applicable.** (Semester 1 or Semester2)	**Module**		**Credit Number[5]**	**Total Student Effort Module (hours)**					**Allocation Of Marks (from the module assessment strategy)**			
		Status	**NFQ Level[1] where specified**	**Credit Units ECTS**	**Total Hours**	**Class (or equiv) Contact Hours**	**Directed e-learning**	**Hours of Independent Learning**	**Work-based learning effort**	**C.A. %**	**Supervised Project %**	**Proctored practical demonstration %**	**Proctored written exam %**
Data Communications and Networking	**1**	**M**	**6**	**5**	**125**	**36**		**89**		**40**			**60**
Object Oriented Programming	**1**	**M**	**6**	**5**	**125**	**48**		**77**		**50**		**50**	
Advanced Databases	**1**	**M**	**6**	**10**	**250**	**48**		**202**		**40**			**60**
Innovation and Business Entrepreneurship	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Team Project	**2**	**M**	**6**	**5**	**125**	**48**		**77**		**100**			
Software Engineering	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Software Quality and Testing	**2**	**M**	**6**	**5**	**125**	**36**		**89**		**100**			
Web Application Development	**3**	**M**	**6**	**10**	**250**	**72**		**178**		**100**			

Data Structures and Algorithms	**3**	**M**	**6**	**10**	**250**	**72**		**178**		**50**		**50**	
Special Regulations (Up to 280 characters)													

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title[3]	**Bachelor of Science (Ord) in Computing**
Modes of Delivery (FT/PT):	**Part Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class[4]	**Award NFQ level**	**Award EQF Level**	**Stage (1, 2, 3, 4, …, or Award Stage):**	**Stage NFQ Level[2]**	**Stage EQF Level[2]**	**Stage Credit (ECTS)**	**Date Effective**	**ISCED Subject code**
Major	**8**	**6**	**3**	**7**	**6**	**60**	**2020**	**0613**

Module Title (Up to 70 characters including spaces)	**Semester no where applicable.** (Semester 1 or Semester2)	**Module**		**Credit Number[5]**	**Total Student Effort Module (hours)**					**Allocation Of Marks (from the module assessment strategy)**			
		Status	**NFQ Level[1] where specified**	**Credit Units ECTS**	**Total Hours**	**Class (or equiv) Contact Hours**	**Directed e-learning**	**Hours of Independent Learning**	**Work-based learning effort**	**C.A. %**	**Supervised Project %**	**Proctored practical demonstration %**	**Proctored written exam %**
Advanced Computer Networks	**1**	**M**	**7**	**5**	**125**	**36**		**89**		**40**			**60**
Introduction to Artificial Intelligence and Machine Learning	**1**	**EA**	**7**	**5**	**125**	**36**		**89**		**50**			**50**
Business and Artificial Intelligence	**1**	**EA**	**7**	**5**	**125**	**36**		**89**		**50**			**50**
Project Management	**1**	**EB**	**7**	**10**	**250**	**48**		**202**		**50**			**50**
Advanced Programming	**1**	**EB**	**7**	**10**	**250**	**72**		**178**		**50**			**50**
Security Fundamentals and Development	**2**	**M**	**7**	**10**	**250**	**48**		**202**		**50**			**50**
Work Placement	**2 & 3**	**EC**	**7**	**30**	**750**	**0**			**750**	**100**			**0**
Academic Internship	**2 & 3**	**EC**	**7**	**30**	**750**	**168**		**582**		**100**			**0**
Special Regulations (Up to 280 characters)													

Students will have to choose an elective module from Electives A (EA).

Students will have to choose an elective module from Electives B (EB).

Students will have to do an elective module from Electives C (EC), either Work Placement or Academic Internship if they won't secure a work placement in the industry.

Learners may specialise in one of 6 areas in their final year: Software Development; Gaming Programming; Blockchain; Artificial Intelligence/Machine Learning/Data Analytics; Internet of Things; Cybersecurity; and Digital Business Transformation. The choice of the above electives will condition the specialisations that a student can follow afterwards in year 4. As such, the following rules apply:

For all the other specialisations except Digital Business Transformation, students must choose from EB, Advanced Programming module.

Students wishing to specialise in Artificial Intelligence/Machine Learning/Data Analytics or Internet of Things must choose from EA Introduction to Artificial Intelligence and Machine Learning module.

Name of Provider:	**National College of Ireland**
Programme Title	**Bachelor of Science (Hons) in Computing**
Award Title	**Bachelor of Science (Hons) in Computing**
Stage Exit Award Title	**N/A**
Modes of Delivery (FT/PT):	**Part Time, Online and Blended**
Teaching and learning modalities	**Direct contact via lectures and demonstrations and Blended e-learning**

Award Class	Award NFQ level	Award EQF Level	Stage(1, 2, 3, 4, …, or Award Stage):	Stage NFQ Level	Stage EQF Level	Stage Credit (ECTS)	Date Effective	ISCED Subject code
Major	**8**	**6**	**Award**	**8**	**6**	**60**	**September 2020**	**0613**

Module Title(Up to 70 characters including spaces)	Semester no where applicable.(Semester 1 or Semester2)	Module		Credit Number	Total Student Effort Module (hours)					Allocation Of Marks (from the module assessment strategy)			
		Status	NFQ Level where specified	Credit Units	Total Hours	Class (or equiv) Contact Hours	Directed e-learning	Hours of Independent Learning	Work-based learning effort	C.A. %	Supervised Project %	Proctored practical demonstration %	Proctored written exam %
Cloud Application Development	**1**	**M**	**8**	**10**	**250**	**60**		**190**		**100**			**0**
Business Analysis	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Blockchain Foundations	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**40**			**60**
Secure Application Programming	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Game Systems	**1**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**

IoT Fundamentals and Development	1	O	8	10	250	48		202		40			60
Artificial Intelligence	1	O	8	10	250	48		202		40			60
Computing Project	1, 2 & 3	M	8	20	500	48		452			100		0
IT Governance, Security and Ethics	2	M	8	5	125	36		89		40			60
Data Application Development	2	O	8	5	125	48		77		100			0
Strategic Management	2	O	8	5	125	36		89		30			70
Digital Forensics	2	O	8	5	125	36		89		50			50
IoT Application Development	2	O	8	5	125	48		77		100			0
Machine Learning	2	O	8	10	250	48		202		40			60
Data Mining and Visualisation Principles	2	O	8	10	250	48		202		100			0
DevOpsSec	2	O	8	5	123	36		89		100			0
Penetration Testing	2	O	8	10	250	48		202		50			50
Games Programming	2	O	8	10	250	48		202		100			0

Blockchain Application Development 1	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**50**			**50**
Blockchain Application Development 2	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Digital Transformation	**2**	**O**	**8**	**10**	**250**	**48**		**202**		**100**			**0**
Mixed Reality	**2**	**O**	**8**	**5**	**125**	**48**		**77**		**100**			**0**

Special Regulations (Up to 280 characters)

The Computing Project module is assessed over both semesters in the final year and accounts for 5 credits in semester 1 and 15 credits in semester 2.

As aforementioned, learners may specialise in one of 7 areas in their final year: Software Development; Gaming Programming; Blockchain; Artificial Intelligence/Machine Learning/Data Analytics; Internet of Things; Cybersecurity; and Digital Business Transformation. The choice of specialisation is conditioned by the electives taken in the 3rd year as specified in the Stage 3 Special regulations.

Those wishing to specialise in Software Development must take the following modules: IoT Fundamentals and Development, DevOpsSec and Secure Application Programming. The latter will be a semester 2 module for the Software Development specialization and a semester 1 module for Cybersecurity.

Those wishing to specialise in Cybersecurity must take the following modules: Secure Application Programming, Penetration Testing and Digital Forensics.

Those wishing to specialise in Internet of Things must take the following modules: IoT Fundamentals and Development, IoT Application Development and Data Mining and Visualisation.

Those wishing to specialise in Gaming Programming must take the following modules: Game Systems, Games Programming and Mixed Reality.

Those wishing to specialise in Artificial Intelligence/Machine Learning/Data Analytics must take the following modules: Artificial Intelligence, Data Application Development and Machine Learning.

Those wishing to specialise in Blockchain must take the following modules: Blockchain Foundations, Blockchain Application Development 1 and Blockchain Application Development 2.

Those wishing to specialise in Digital Business Transformation must take the following modules: Business Analysis, Strategic Management and Digital Transformation.