BED (HONS) SCIENCE EDUCATION - CK413

Overview

NFQ Level 8, Major Award

Course Outline

This full-time degree programme is of four years duration and enables you to become a fully qualified science teacher of two specialist subjects within these four years. Training takes place in UCC's stateof-the-art Eureka Centre for Inquiry-Based Education in Science and Mathematics and also in the science laboratories of the College of Science, Engineering and Food Science.

The course is designed to ensure that it is compliant with all requirements of the Teaching Council as specified in the relevant Teaching Council documentation: https://www.teachingcouncil.ie/en/ news-events/latest-news/curricular-subject-requirements.pdf

On completion of the programme you will be fully qualified to teach your two specialist subjects to Leaving Certificate standard. The total number of credits studied in each subject area over the four years of the programme is summarised in the following table:

Science Subject 1	Science Subject 2	Education	Total
60 credits 60 credits		120 credits (inclusive of 60 credits of School Placement)	240 credits

On entering the programme, students choose one of the following five routes:

Route 1: Biology + Chemistry

Route 2: Physics + Mathematics

Route 3: Computer Science + Mathematics

Route 4: Chemistry + Mathematics

Route 5: Computer Science + Chemistry

In Year 1 all students study **10** credits of Education and a total of **50** credits of their two specialist subjects. In this year you will study the foundations of your two specialist science subjects and will receive an introduction to science teaching and science education.

In Year 2 all students study **20** credits of their first specialist science subject, **20** credits of their second specialist subject and **20** credits of Education. You will study your two specialist subjects in more details and will spend some time on School Placement (minimum of 3 hours per week over 10 weeks) in a local secondary school. Your School Placement will be fitted in around your UCC lectures and laboratory practical sessions.

In Year 3 all students study 30 credits of Education and a total of 30 credits of their specialist science subjects. You will continue studying your two specialist subjects in more details and will spend some time on School Placement (minimum of 3 hours per week over 10 weeks) in

a local secondary school. Your School Placement will be fitted in around your UCC lectures and laboratory practical sessions.

In Year 4, all modules are education modules, with increased time spent on School Placement (minimum of 4 hours per week from August to May) and also time spent at lectures and laboratory practical sessions at UCC.

Course Practicalities

Year 1: A mixture of lectures, laboratory practical sessions, seminars and microteaching sessions.

Years 2, 3, & 4: A mixture of lectures, laboratory practical sessions, and School Placement in local secondary schools. Your workload will consist of studying lecture notes, writing up practical laboratory notes, and preparing lesson plans for the lessons that you teach in school. Your School Placement is fitted in around your normal lectures in UCC.

Assessment

Written exams take place before Christmas and in May. Not all modules will have formal examinations. Many modules use other types of assessment. In Year 1, the assessment methods consist mainly of written examinations and continuous assessment of laboratory practical work. In years 2 and 3, the assessment consists of written examinations, continuous assessment of laboratory practical work, and School Placement. Your School Placement will be supervised by a member of staff of UCC's School of Education. In year 4, the entire year is assessed mainly by means of continuous assessment involving project work, laboratory practical work, and supervision of School Placement.

Who teaches this course

Teaching is carried out by staff drawn from the following:

School of Education

Department of Physics

School of Biochemistry and Cell Biology

School of Biological, Earth and Environmental Science (BEES)

School of Chemistry

School of Computer Science and Information Technology

School of Mathematical Sciences

School of Microbiology

Programme Requirements

For information about modules, module choice, options and credit weightings, please go to Programme Requirements (p. 1).

Programme Requirements

Code Year 1	Title	Credits 60
Students take m following routes	nodules to the value of 60 credits in one of the s:	
Route 1 (Biology	and Chemistry)	
Students take 6	0 credits as follows:	
Core Modules		
Biology		
BC1001	Introduction to Biochemistry and the Biologi Basis of Disease (5)	cal

BL1002	Cells, Biomolecules, Genetics and Evolution (5)	CM1201	Fundam
BL1004	Physiology and Structure of Plants and Animals	CM1203	Teachin
	(5)	Mathematics	
BL1006	Habitats and Ecosystems (5)	AM1052	Introduc
MB1003	Microbiology in Society (5)	MA1058	Introduc
Chemistry		MA1059	Calculus
CM1200	Fundamentals of Modern Chemistry Part 1 (10)	MS2013	Geomet
CM1201	Fundamentals of Modern Chemistry Part 2a (10)	ST1051	Introduc
CM1203	Teaching Chemistry Concepts (5)	Education	
Education		ED1101	Introduc
ED1101	Introduction to Science Education (5)	ED1102	Introduc
ED1102	Introductory Teaching Practice Placement Science		Educati
Douto 2 (Dhuaia	Education (5) $\frac{1}{2}$	Route 5 (Compu	ter Science
Route 2 (Physic		Students take 6	50 credits a
Students take	60 credits as follows:	Core Modules	
Core Modules		Computer Scier	nce
Physics		CS1022	Introduc
PY1052	Introductory Physics I (10)		(15)
PY1053	Introductory Physics II (10)	CS1115	Web De
Mathematics		CS1021	Relation
AM1052	Introduction to Mechanics (5)	Chemistry	
AM1053	Introduction to Mathematical Modelling (5)	CM1200	Fundam
MA1058	Introduction to Linear Algebra (5)	CM1201	Fundam
MA1059	Calculus (5)	CM1203	Teachin
MS2013	Geometry (5)	Education	
ST1051	Introduction to Probability and Statistics (5)	ED1101	Introduc
Education		ED1102	Introduc
ED1101	Introduction to Science Education (5)		Educati
ED1102	Introductory Teaching Practice Placement Science Education (5)	Year 2 Students take r	nodules to
Route 3 (Comp.	uter Science and Mathematics) ¹	following route	s:
Students take	60 credits as follows:	Route 1 (Biology	/ and Chemi
Core Modules		Students take 6	50 credits a
Computer Scie	nce	Core Modules	
CS1022	Introduction to Programming and Problem Solving	Biology	
00.011	(15)	AE2001	Fundam
CS1115	Web Development 1 (5)	MB2905	Fundam
Mathematics		ML2001	Introduc
AM1052	Introduction to Mechanics (5)	PS2001	Introduc
AM1053	Introduction to Mathematical Modelling (5)	Chemistry	
MA1058	Introduction to Linear Algebra (5)	CM2001	Main Gr
MA1059	Calculus (5)	CM2002	Fundam
MS2013	Geometry (5)	CM2005	Structur
ST1051	Introduction to Probability and Statistics (5)	0.112000	Compou
Education		CM2008	Structur
FD1101	Introduction to Science Education (5)	Education	
ED1102	Introductory Teaching Practice Placement Science	ED2103	(10)
LDTTUZ	Education (5)	ED2104	(10)
Route 4 (Chemi	stry and Mathematics) ¹	Route 2 (Physic	s and Mathe
Students take	60 credits as follows:	Students take f	50 credits a
Core Modules		Core Modules	u
Chemistry		Physics	
CM1200	Fundamentals of Modern Chemistry Part 1 (10)	PY2101	Classics
01011200	randamentals of wouch offenistry rait r (10)	1 12101	01033160

CM1201	Fundamentals of Modern Chemistry Part 2a (10)			
CM1203	Teaching Chemistry Concepts (5)			
lathematics				
AM1052	Introduction to Mechanics (5)			
MA1058	Introduction to Linear Algebra (5)			
MA1059	Calculus (5)			
MS2013	Geometry (5)			
ST1051	Introduction to Probability and Statistics (5)			
ducation				
ED1101	Introduction to Science Education (5)			
ED1102	Introductory Teaching Practice Placement Science Education (5)			
oute 5 (Computer	Science and Chemistry)			
tudents take 60	credits as follows:			
ore Modules				
computer Science	2			
CS1022	Introduction to Programming and Problem Solving (15)			
CS1115	Web Development 1 (5)			
CS1021	Relational Databases I (5)			
hemistry				
CM1200	Fundamentals of Modern Chemistry Part 1 (10)			
CM1201	Fundamentals of Modern Chemistry Part 2a (10)			
CM1203	Teaching Chemistry Concepts (5)			
ducation				
ED1101	Introduction to Science Education (5)			
ED1102	Introductory Teaching Practice Placement Science Education (5)			
'ear 2		60		
tudents take mo ollowing routes:	dules to the value of 60 credits in one of the			
oute 1 (Biology ar	nd Chemistry)			
tudents take 60	credits as follows:			
ore Modules				
iology				
AE2001	Fundamentals of Ecology (5)			
MB2905	Fundamentals of Microbiology (5)			
ML2001	Introductory Molecular Biology (5)			
PS2001	Introduction to Plant Biotechnology (5)			
hemistry				
CM2001	Main Group and Transition Element Chemistry (5)			
CM2002	Fundamentals of Organic Chemistry (5)			
CM2005	Structures and Reactions of Main Group Compounds (5)			
CM2008	Structure, Bonding and Quantum Mechanics (5)			
ducation				
ED2103	(10)			
ED2104	(10)			
oute 2 (Physics and Mathematics)				
tudents take 60 credits as follows:				
ore Modules				
hysics				
PY2101	Classical Mechanics (5)			

PY2102	Introduction to Quantum Physics (5)	Chemistry	
PY2103	Electrostatics and Magnetostatics (5)	CM2001	Main Group and Transition Element Chemistry (5)
PY2108	Experimental Methods I (5)	CM2002	Fundamentals of Organic Chemistry (5)
Mathematics		CM2005	Structures and Reactions of Main Group
AM2071	Fourier Methods (5)		Compounds (5)
MA2071	Multivariable Calculus (5)	CM2008	Structure, Bonding and Quantum Mechanics (5)
MS2005	Discrete Mathematics (5)	Education	
MS2014	Algebraic Methods and Applications (5)	ED2103	(10)
Education		ED2104	(10)
ED2103	(10)	Year 3	60
ED2104	(10)	Students take	modules to the value of 60 credits in one of the
Route 3 (Compu	iter Science and Mathematics)	following route	es:
Students take (60 credits as follows:	Route 1 (Biolog	y and Chemistry)
Core Modules		Students take	60 credits as follows:
Computer Scie	nce	Core Modules	
CS1110	Computer Hardware Organization (5)	Biology	
CS1111	Systems Organisation (5)	BL2001	Plant and Animal Genetics (5)
CS2214	Multimedia (5)	BC2001	Biomolecules (5)
CS5007	Computer Applications Programming (5)	ZY2000	Vertebrate Diversity (5)
Mathematics		Chemistry	
AM2071	Fourier Methods (5)	CM2003	Energetics and Kinetics (5)
MA2071	Multivariable Calculus (5)	CM2004	States of Matter (5)
MS2005	Discrete Mathematics (5)	CM2007	Spectroscopy (5)
MS2014	Algebraic Methods and Applications (5)	Education	
Education		ED3101	Science Education II (15)
ED2103	(10)	ED3102	Teaching Practice Placement Science Education II
ED2104	(10)		(15)
Route 4 (Chemis	stry and Mathematics)	Route 2 (Physic	cs and Mathematics)
Students take (60 credits as follows:	Students take	60 credits as follows:
Core Modules		Core Modules	
Chemistry		Physics	
CM2001	Main Group and Transition Element Chemistry (5)	PY2107	Experimental Physics I (5)
CM2002	Fundamentals of Organic Chemistry (5)	PY3101	Optics (5)
CM2005	Structures and Reactions of Main Group	PY3103	Electromagnetism (5)
	Compounds (5)	PY3IU7	Experimental Physics II (5)
CM2008	Structure, Bonding and Quantum Mechanics (5)	Mathematics	
Mathematics		AMI3U51	vector and Tensor Methods (5)
AM2071	Fourier Methods (5)	Plus one modu	Lie from the following:
MA2071	Multivariable Calculus (5)	MS3001	Introduction to Abstract Algebra (5)
MS2005	Discrete Mathematics (5)	WIS3016	Vector Spaces and Linear Alashra (5)
MS2014	Algebraic Methods and Applications (5)	MS3017	vector Spaces and Linear Algebra (5)
Education		MA4403	Discrete Time Financial Models (5)
ED2103	(10)	WIS3020	Computational Data Architica (5)
ED2104	(10)	MS3021	Computational Data Analytics (5)
Route 5 (Compu	iter Science and Chemistry)	MS3022	Uperations Research (5)
Students take	60 credits as follows:	MS3023	Stochastic Decision Science (5)
Core Modules		Education	
Computer Scie	nce	ED3101	Science Education II (15)
CS1110	Computer Hardware Organization (5)	ED3102	reaching Practice Placement Science Education II
CS1111	Systems Organisation (5)	Route 2 (Comm	(13) uter Science and Mathematics)
CS2214	Multimedia (5)	Studente teke	
CS5007	Computer Applications Programming (5)		
		core moaules	

Computer Scie	nce	P
CS3500	Software Engineering (5)	
Plus three mod	lules from the following:	
CS1021	Relational Databases I (5)	
CS1116	Web Development 2 (5)	
CS1069	Introduction to Internet Technologies (5)	
CS2213	Data Analytics for Digital Humanities I (5)	C
CS2517	Multimedia 2 (5)	
CS3062	Computing in Society (5)	
Mathematics		
AM3051	Vector and Tensor Methods (5)	E
Plus one modu	le from the following:	
MS3001	Introduction to Abstract Algebra (5)	
MS3016	Introduction to Analysis and Metric Spaces (5)	
MS3017	Vector Spaces and Linear Algebra (5)	Y
MA4403	Discrete Time Financial Models (5)	St
MS3020	Linear Predictive Modelling (5)	fc
MS3021	Computational Data Analytics (5)	Re
MS3022	Operations Research (5)	St
MS3023	Stochastic Decision Science (5)	С
Education	(-)	E
ED3101	Science Education II (15)	
ED3102	Teaching Practice Placement Science Education II	
Route 4 (Chemis	stry and Mathematics)	
Students take (50 credits as follows:	
Core Modules		
Chemistry		
CM2003	Energetics and Kinetics (5)	
CM2004	States of Matter (5)	
CM2007	Spectroscopy (5)	
Mathematics		
AM3051	Vector and Tensor Methods (5)	
MS2022	Mathematical Modelling ()	
Plus one modu	le from the following:	R
MS3001	Introduction to Abstract Algebra (5)	St
MS3016	Introduction to Analysis and Metric Spaces (5)	C
MS2017	Vector Spaces and Linear Algebra (5)	F
MA4403	Discrete Time Financial Models (5)	
MS2020	Linear Predictive Medelling (5)	
MS2021	Computational Data Analytica (5)	
NS3021	Operational Data Analytics (5)	
NS3022	Operations Research (5)	
IVIS3023	Stochastic Decision Science (5)	
Education	Ocieran Education II (15)	
ED3101	Science Education II (15)	
ED3102	(15)	
Route 5 (Compu	Iter Science and Chemistry)	
Students take	50 credits as follows:	
Core Modules		
Computer Scie	nce	
CS3500	Software Engineering (5)	Re

Plus t	wo modules	from the following:	
CS	1069	Introduction to Internet Technologies (5)	
CS	1116	Web Development 2 (5)	
CS	2213	Data Analytics for Digital Humanities I (5)	
CS	2517	Multimedia 2 (5)	
CS	3062	Computing in Society (5)	
Chem	istrv		
CM	12003	Energetics and Kinetics (5)	
CN	12003	States of Matter (5)	
CM	12004	Spectroscopy (5)	
Eduor	ntion	Specifoscopy (3)	
	2101	Science Education II (15)	
ED	3102	Teaching Practice Placement Science Education II	
Year 4	1	(10)	60
Stude follow	• ents take moo ving routes:	dules to the value of 60 credits in one of the	
Route	1 (Biology ar	nd Chemistry)	
Stude	ents take 60 of	credits as follows:	
Core N	Nodules		
Educa	ation		
ED	4101	Science Education III (10)	
ED	4102	Teaching Practice Placement Science Education III (20)	
ED	4103	Conceptual Foundations in School Placement Research Portfolio A (5)	
ED	4104	Conceptual Foundations in the Philosophy and History of Education (5)	
ED	4105	Conceptual Foundations in the Psychology and Sociology of Education (5)	
ED	4106	Conceptual Foundations in Curriculum and Assessment (5)	
ED	4107	Conceptual Foundations in Inclusive Education (5)	
ED	4108	Conceptual Foundations in School Placement Research Portfolio B (5)	
Route	2 (Physics a	nd Mathematics)	
Stude	ents take 60 o	credits as follows:	
Core N	Nodules		
Educa	ation		
ED	4101	Science Education III (10)	
ED	4102	Teaching Practice Placement Science Education III (20)	
ED	4103	Conceptual Foundations in School Placement Research Portfolio A (5)	
ED	4104	Conceptual Foundations in the Philosophy and History of Education (5)	
ED	4105	Conceptual Foundations in the Psychology and Sociology of Education (5)	
ED	4106	Conceptual Foundations in Curriculum and Assessment (5)	
ED	4107	Conceptual Foundations in Inclusive Education (5)	
ED	4108	Conceptual Foundations in School Placement Research Portfolio B (5)	
Routo	3 (Computer	Science and Mathematics)	

Route 3 (Computer Science and Mathematics)

Students take 60 credits as follows:

Core Modules	
Education	
ED4101	Science Education III (10)
ED4102	Teaching Practice Placement Science Education III (20)
ED4103	Conceptual Foundations in School Placement Research Portfolio A (5)
ED4104	Conceptual Foundations in the Philosophy and History of Education (5)
ED4105	Conceptual Foundations in the Psychology and Sociology of Education (5)
ED4106	Conceptual Foundations in Curriculum and Assessment (5)
ED4107	Conceptual Foundations in Inclusive Education (5)
ED4108	Conceptual Foundations in School Placement Research Portfolio B (5)

Route 4 (Chemistry and Mathematics)

Students take 60 credits as follows:

Students take ou cleans as follows.		
	Core Modules	
	Education	
	ED4101	Science Education III (10)
	ED4102	Teaching Practice Placement Science Education I (20)
	ED4103	Conceptual Foundations in School Placement Research Portfolio A (5)
	ED4104	Conceptual Foundations in the Philosophy and History of Education (5)
	ED4105	Conceptual Foundations in the Psychology and Sociology of Education (5)
	ED4106	Conceptual Foundations in Curriculum and Assessment (5)
	ED4107	Conceptual Foundations in Inclusive Education (5)
	ED4108	Conceptual Foundations in School Placement Research Portfolio B (5)

Route 5 (Computer Science and Chemistry)

Students take **60** credits as follows:

Core Modules

Table	
ED4108	Conceptual Foundations in School Placement Research Portfolio B (5)
ED4107	Conceptual Foundations in Inclusive Education (5)
ED4106	Conceptual Foundations in Curriculum and Assessment (5)
ED4105	Conceptual Foundations in the Psychology and Sociology of Education (5)
ED4104	Conceptual Foundations in the Philosophy and History of Education (5)
ED4103	Conceptual Foundations in School Placement Research Portfolio A (5)
ED4102	Teaching Practice Placement Science Education III (20)
ED4101	Science Education III (10)
Education	

Students must have a minimum grade of H3 in Leaving Certificate Mathematics to enter this route.

Examinations

Full details and regulations governing Examinations for each programme will be contained in the *Marks and Standards Book* and for each module in the *Book of Modules*.

Programme Learning Outcomes

Programme Learning Outcomes for BEd (Hons) Science Education (NFQ Level 8, Major Award)

On successful completion of this programme, students should be able to:

- Identify the key characteristics of excellent teaching in science as related to subject knowledge and pedagogy and engage in research of these areas.
- Apply the scientific knowledge and pedagogical skills gained in the programme to prepare lesson plans and schemes of work of the highest standard.
- Recognise and apply the basic principles of managing a learning environment.
- Develop comprehensive portfolios of teaching, learning and assessment that are relevant to the science curricula in schools.
- Evaluate the various theories of Teaching and Learning and apply these theories to assist in the creation of effective and inspiring science lessons.
- Critically evaluate the effectiveness of their teaching of science subjects in the second-level school system.
- Display a willingness to co-operate with members of the teaching staff in their assigned school.
- Foster an interest in science and a sense of enthusiasm for science subjects in their pupils.
- Synthesise the key components of laboratory organisation and management and perform laboratory work in a safe and efficient manner.
- Communicate effectively with the school community and with society at large in the area of science education.