LEVEL 3 INTERNATIONAL FOUNDATION DIPLOMA FOR HIGHER EDUCATION STUDIES

(L3IFDHES)

NCC Education
Qualification Unit Specification
2023

LEVEL 3 INTERNATIONAL FOUNDATION DIPLOMA FOR HIGHER EDUCATION STUDIES (IFDHES)

Modification History

Version	Revision Description
V1.10	Update entry requirements
V1.11	Updated Ofqual link in Section 1.1
V1.12	Corrections to DELS and AELS syllabus Aug 2020
V1.13	March 2021 – updated ITB and ITAE syllabus tables, LO/AC tables, grade descriptors, assessment type tables and assessment method in Section 3.2
V1.14	July 2023 - updated wording of entry requirements

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), the English qualifications, examinations and assessments regulator.

1.1 Why choose this qualification?

NCC Education's Level 3 International Foundation Diploma for Higher Education Studies (L3IFDHES) is designed for speakers of English as a foreign language who are seeking to gain entry to Higher Education qualifications taught and assessed in English.

NCC Education's Level 3 International Foundation Diploma for Higher Education Studies is:

- **Regulated** by Ofqual under the Regulated Qualifications Framework.

  For more information see:

  https://www.gov.uk/what-different-qualification-levels-mean/list-of-qualification-levels

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

- **A valuable university preparation qualification** which allows candidates to demonstrate their English language skills (both general and academic) together with key transferrable study skills, cultural knowledge and mathematical understanding, as well as an understanding of the essential concepts of business and economics (Business electives), the essential concepts of computing and programming (Computing electives) or the essential mathematical and physics concepts required for undergraduate study in Engineering (Engineering electives).

  The Level 3 International Foundation Diploma for Higher Education Studies syllabus and assessment is suitable for students aged 16-19 as well as adult learners.

- **Recognised and valued** by many universities, both in the UK and in other countries. There are over fifty university progression routes to UK and overseas universities. For more details of the universities that successful L3IFDHES candidates can progress to, see www.nccedu.com

- **A pathway** to NCC Education's Level 4 Diploma qualifications and greater employment opportunities

2. Structure of the L3IFDHES Qualification

Qualification Title, Credits, Units

NCC Education Level 3 International Foundation Diploma for Higher Education Studies, 120 credits.

Total Qualification Time: 1,200 hours

Guided Learning Hours: 670

Candidates must pass all core Units and two elective Units to be awarded the Level 3 International Foundation Diploma for Higher Education Studies certificate.

Core Units

Developing English Language Skills (TQT: 300 hours/ 30 credits)	Advanced English Language Skills (TQT: 200 hours / 20 credits)	English for Academic Purposes (TQT: 100 hours / 10 credits)	Study and Communication Skills (TQT: 200 hours/ 20 credits)
Culture Studies (TQT: 100 hours / 10 credits)	Foundation Mathematics (TQT: 100 hours / 10 credits)		

Elective Units

Business Units		Computing Units	
Introduction to Business (TQT: 100 hours / 10 credits)	Introduction to Accounting and Economics (TQT: 100 hours / 10 credits)	Introduction to Computer Science (TQT: 100 hours / 10 credits)	Introduction to Programming (TQT: 100 hours / 10 credits)
Engineering Units		**Health Sciences Units**	
Further Mathematics (TQT: 100 hours / 10 credits)	Physics (TQT: 100 hours / 10 credits)	Chemistry (TQT: 100 hours / 10 credits)	Biology (TQT: 100 hours / 10 credits)
Chemical Engineering Units		**Higher Finance Units**	
Further Mathematics (TQT: 100 hours / 10 credits	Chemistry (TQT: 100 hours / 10 credits)	Introduction to Accounting and Economics (TQT: 100 hours / 10 credits)	Further Mathematics (TQT: 100 hours / 10 credits)

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 Assignment	Global Examination
Developing English Language Skills	100%		
Advanced English Language Skills	100%		
English for Academic Purposes		100%	
Study and Communication Skills		100%	
Culture Studies		100%	
Foundation Mathematics			100%
Introduction to Computer Science			100%
Introduction to Programming		100%	
Introduction to Business		100%	
Introduction to Accounting and Economics		100%	
Further Mathematics			100%
Physics			100%
Chemistry			100%
Biology			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. Local Examinations and Global Assignments are marked 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 *Connect*, NCC Education's student registration system.

4. Administration

4.1 Assessment Cycles

1. Four assessment cycles are offered throughout the year during 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 Centre Support. It is also available on *Connect,* 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
Students must meet the following entry requirements: • Completed their GCSE/IGCSE 'O' Levels or an equivalent* qualification in their own country and passed 5 subjects with minimum grades of 'C', '4' or equivalent* in each. These should include Mathematics and English. • Have a valid score of 4.5 or above in the International English Language Testing System (IELTS) examination or equivalent for students whose first language is not English. Alternatively, students can take the free NCC Education Standard English Placement Test which is administered by our Accredited Partner Centres. * Centres need to provide evidence to justify any equivalency decision (both qualification equivalency and grade equivalency) they make pertaining to any enrolments via non-GCSE or non-standard routes.

4.5 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.

4.6 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

5.1 Developing English Language Skills

Title	Developing English Language Skills
Unit reference number	L/615/0156
Credits	30
Level	3

Guided Learning Hours	180 hours		Total Qualification Time	300 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Be able to communicate fluently, accurately and effectively, speaking on a range of topics, with appropriate control of grammar, vocabulary and register	1.1 Demonstrate confident and accurate use of a range of tenses and grammatical structures 1.2 Participate in discussion of familiar issues, giving relevant and meaningful contributions appropriate to the conversation and participants 1.3 Demonstrate use of natural stress and intonation 1.4 Demonstrate, when participating in discussion, being understood without any recurring or major difficulty on the part of the listener 1.5 Prepare and present simple information to others confidently and clearly
2. Be able to read with independence and comprehend the main content and overall meaning of a range of general texts in English	2.1 Readily grasp the essential meaning of general English texts 2.2 Locate relevant details in a long text 2.3 Demonstrate the ability to understand stances, viewpoints and conclusions made in a range of general English texts 2.4 Understand clearly written and straightforward instructions
3. Be able to write factual, descriptive and explanatory texts, accurately using a range of linguistic structures and vocabulary, to complete clearly defined tasks	3.1 Demonstrate the ability to write a summary of information given or researched 3.2 Demonstrate the ability to write in a range of different styles appropriate to tasks 3.3 Demonstrate the ability to accurately use different linguistic structures to complete written tasks on a range of familiar topics 3.4 Demonstrate the ability to organise, develop and link points together for a range of clearly defined writing tasks
4. Be able to apply a range of listening strategies in order to understand spoken language on familiar and some unfamiliar topics	4.1 Demonstrate the ability to pick out key information when listening to a range of speakers 4.2 Understand the main points of a linguistically complex lecture or talk 4.3 Demonstrate the ability to predict the content of a conversation or speech on a general topic, based on listening to a brief introduction or extract 4.4 Demonstrate the ability to utilise their listening skills in order to participate meaningfully in discussion of familiar issues

Syllabus			
Unit No	Title	Proportion	Content
Intermediate Level			
1	Introductions	1/24 6 hours of class time 5 hours of private study	• Present continuous and present simple • Forming questions • Everyday activities • Letter writing
2	Memory	1/24 6 hours of class time 5 hours of private study	• Past simple and past continuous tenses • *Used to* • Writing about a memorable event • Discussing past events
3	Food and Family	1/24 6 hours of class time 5 hours of private study	• Understanding opinions • Future forms • Eating in and eating out • Adjectives of personality • Writing about a person
4	Money and Charity	1/24 6 hours of class time 5 hours of private study	• Present perfect and past simple tenses • For and since • Vocabulary related to money • Strong adjectives
Review	Review 1	1 hour of class time 1 hour of private study	• Review the language learned in Topics 1 – 4 • Formative progress test
5	Transport and Places	1/24 6 hours of class time 5 hours of private study	• Comparatives and superlatives • Linking • Agreeing and disagreeing • Vocabulary related to transport • Presentations about cities • Articles • Designing a race around a city
6	Rules for Success	1/24 7 hours of class time 6 hours of private study	• Modal verbs • Relative pronouns • -ed –ing adjectives • Phone language • Sentence stress
7	Sport	1/24 7 hours of class time 6 hours of private study	• Past tenses • Usually and used to • Vocabulary related to sport • Pronouncing the letter 's' • Finding the meaning of key words
8	Appearing on Film	1/24 7 hours of class time	• Passives • Modals of deduction • Vocabulary related to film, TV and appearances

		6 hours of private study	• Film reviews
Review	Review 2	1 hour of class time 1 hour of private study	• Review the language learned in Topics 5 – 8 • Formative progress test
9	At Home and at School	1/24 6 hours of class time 6 hours of private study	• Conditional sentences • Future time clauses • Vocabulary related to home and school • Comprehension questions • Sentence stress
10	Working and Shopping	1/24 7 hours of class time 6 hours of private study	• Reported speech • Gerunds and infinitives • Letters of Complaint • Expressing an opinion • Agreeing and disagreeing with an argument.
11	The Modern World	1/24 7 hours of class time 6 hours of private study	• Quantifiers • Word forms • Phrasal verbs • Hypothetical sentences with *if* • For and against arguments • Linking words • Planning, organising and writing an essay • Analysing a writer's opinion • Summarising a text
12	Fame and Infamy	1/24 6 hours of class time 6 hours of private study	• Relative clauses • Question tags • Vocabulary about crime • Writing about a famous person • Skimming a text for key information • Crime reports
Review	Review 3	1 hour of class time 1 hour of private study	• Review the language learned in Topics 9 – 12 • Formative progress test
Upper-intermediate Level			
13	Past, Present and Future	1/24 8 hours of class time 4 hours of private study	• Past tenses • Auxiliary verbs • Time phrases • The verb *get* • Collocations
14	Questions and Answers	1/24 8 hours of class time	• Question formation • Word formation • Compound adjectives

		4 hours of private study	• Working out meaning from context • Use of dictionaries
15	Varieties of Writing	1/24 8 hours of class time 4 hours of private study	• Narrative tenses • Adverbs • Word stress and intonation • Writing about an exciting event in the past • Introduction to IELTS writing
16	Sickness and Health	1/24 8 hours of class time 3 hours of private study	• Present perfect simple and continuous • Adjectives • Vocabulary about illness • Introduction to IELTS listening
Review	Review 4	1 hour of class time 1 hour of private study	• Review the language learned in Topics 13 – 16 • Formative progress test
17	Travel and Places	1/24 8 hours of class time 4 hours of private study	• Past perfect and past perfect continuous • Irregular past tenses • Adverbial phrases • Note taking • Presentations • Introduction to IELTS reading
18	The Environment	1/24 8 hours of class time 4 hours of private study	• Future perfect and future continuous • Future time clauses • Vocabulary about the environment and weather • Introduction to IELTS speaking
19	Feelings and Emotions	1/24 8 hours of class time 4 hours of private study	• Unreal conditionals • Structures after *wish* • -ed –ing adjectives • Vocabulary in context • Regrets
20	Music	1/24 8 hours of class time 4 hours of private study	• Gerunds and infinitives • used to • Vocabulary about music • Borrowed words • Sentence stress and linking • Summarising a text
Review	Review 5	1 hour of class time 1 hour of private study	• Review the language learned in Topics 17 – 20 • Formative progress test
21	Making an Argument	1/24 8 hours of class time	• Past modals • Writing a balanced essay • Verbs of the senses

		4 hours of private study	• Vocabulary about the body • Making arguments • IELTS speaking practice
22	Reporting Stories	1/24 8 hours of class time 4 hours of private study	• The passive • Reporting verbs • Vocabulary about crime and the media • Formal and informal letters • Word formation • IELTS reading practice
23	The Urban World	1/24 8 hours of class time 4 hours of private study	• Contrast and purpose • Uncountable and plural nouns • Prefixes and suffixes • Listening for gist and details • Presenting information about a city • Writing travel reviews • IELTS reading practice
24	Science	1/24 9 hours of class time 4 hours of private study	• Quantifiers • Articles • Vocabulary about science • Collocations • Describing data • Giving presentations
Review	Review 6	1 hour of class time 1 hour of private study	• Review the language learned in Topics 21 – 24 • Formative progress test

Assessment Type
Local Examination (100%)
See also Section 3 above

5.2 English for Academic Purposes

Title	English for Academic Purposes
Unit reference number	Y/615/0158
Credits	10
Level	3

Guided Learning Hours	60 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Be able to utilise different 'pre', 'while' and post reading strategies to understand academic texts	1.1 Predict the content of various academic texts prior to reading them fully 1.2 Identify the overall function of an academic text 1.3 Identify the specific function of sentences, paragraphs and sections in academic texts 1.4 Demonstrate comprehension of a range of academic texts
2. Be able to demonstrate an appropriate academic vocabulary	2.1 Identify subject specific vocabulary in a range of academic texts 2.2 Demonstrate active use of a range of subject specific vocabulary 2.3 Use subject specific vocabulary accurately
3. Be able to structure sentences, paragraphs and full texts to suit academic requirements	3.1 Demonstrate an understanding of what is required in a range of academic writing tasks at this level 3.2 Demonstrate the ability to use the structure and linguistic conventions of well written academic sentences 3.3 Demonstrate the ability to use the structure and linguistic conventions of well written academic paragraphs 3.4 Demonstrate the ability to link sentences, paragraphs and sections together to produce overall cohesion in academic writing 3.5 Follow a step by step process to produce a final draft piece of academic writing
4. Be able to utilise 'pre', 'while' and post listening strategies to understand different speakers and academic topic information	4.1 Demonstrate the ability to recognise linguistic signposts and reference markers when listening to different speakers and to different delivery styles 4.2 Demonstrate the ability to utilise notes made whilst listening to a range of different speakers 4.3 Identify key information when listening to a range of speakers and delivery styles

Syllabus			
Unit No	Title	Proportion	Content
Intermediate Level			
1	Entertainment	1/5 12 hours of class time 7 hours and 30 minutes of private study	Students focus on the initial processes and strategies involved when approaching academic writing, reading and listening tasks: • Examining structures of academic written texts • Considering simple, compound and complex sentences • Considering the basic elements of a paragraph • Using the passive voice in academic writing • Considering pre-listening strategies • Listening for gist and for specific information • Understanding academic word lists • Understanding the process of reading • Using prediction strategies as a pre-reading technique
2	The Environment	1/5 13 hours of class time 7 hours and 30 minutes of private study	Students focus on detailed processes and strategies for beginning to tackle academic writing, reading and listening tasks: • Using word transformations in academic writing • Using signposting in academic writing • Practising cohesion within paragraphs • Considering the use of punctuation in academic writing • Recognising signposts in a lecture • Examining solutions to spelling difficulties • Examining strategies for exploiting Activities in a lecture • Exploiting the use of visual aids in lectures • Considering the use of dictionaries • Understanding how affixes and roots show word meanings • Practising skimming skills to extract the main idea from a text • Practising scanning skills to search for specific information in a text
3	Travel and Transport	1/5 12 hours of class time	Students focus on some of the methods involved in exploiting academic writing, reading and listening materials: • Examining paraphrasing and summarising other writers' work

		7 hours and 30 minutes of private study	• Understanding the issue of plagiarism and how to reference a source • Considering thesis statements • Considering how to respond to questions and instructions in academic writing • Understanding the paralinguistic features of a lecture • Examining the use of inference in lectures • Understanding attitude and opinion in lectures • Understanding how to deal with less-frequent vocabulary • Understanding how to use the contents and index pages of a text • Making inferences from written work
4	Achievements	1/5 11 hours of class time 7 hours and 30 minutes of private study	Students focus on polishing their skills in academic writing, reading and listening: • Organising details and examples in a written text • Providing feedback on a piece of writing • Considering paragraph divisions within a text • Examining how referencing is used by lecturers • Considering the structure of academic lectures • Working out the meaning of unknown vocabulary • Practising intensive reading • Considering the use of linking words in a text • Practising note-taking techniques
5	Technology	1/5 12 hours of class time 8 hours of private study	Students focus on techniques for enhancing their skills in academic writing, reading, and listening: • Examining techniques for adding and hiding opinion in writing • Considering the importance of proof reading • Correcting written work based on criteria • Developing a system of abbreviations for notetaking • Discovering how best to record new vocabulary • Finding further reading material on a subject • Examining connotations and opinions in writing

Assessment Type

Global Assignment (100%)

See also Section 3 above

5.3 Advanced English Language Skills

Title	Advanced English Language Skills
Unit reference number	R/615/0157
Credits	20
Level	3

Guided Learning Hours	120 hours	**Total Qualification Time**	200 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Be able to communicate fluently, accurately and effectively, speaking on a range of familiar and unfamiliar topics, with appropriate control of grammar, vocabulary and register	1.1 Demonstrate confident and accurate use of the full range of tenses and grammatical structures 1.2 Participate in discussion of a broad range of issues, giving relevant and meaningful contributions appropriate to the conversation and participants 1.3 Demonstrate good use of natural stress and intonation 1.4 Participate in discussion, and be understood without difficulty on the part of the listener 1.5 Prepare and present detailed information to others confidently and clearly
2. Be able to read with independence and comprehend the main content and overall meaning of a range of general and more unfamiliar texts in English	2.1 Readily grasp the essential meaning of a range of general English texts 2.2 Locate specific details and key information in a long and complex text 2.3 Demonstrate the ability to understand stances, viewpoints and conclusions made in a range of complex English texts 2.4 Demonstrate the ability to understand the inferences made in a range of general and more unfamiliar English texts
3. Be able to write structured, factual, descriptive and explanatory texts, accurately using complex linguistic structures and vocabulary	3.1 Demonstrate the ability to write a clear and concise summary of information given or researched 3.2 Demonstrate the ability to write in a range of different styles appropriate to tasks 3.3 Demonstrate the ability to accurately use a wide range of linguistic structures to produce pieces of writing on a range of familiar and some unfamiliar topics 3.4 Demonstrate the ability to organise, develop and link points effectively in a range of written pieces of work
4. Be able to apply a range of listening strategies in order to understand lengthy predicable discussions, factual presentations and more abstract conversations	4.1 Demonstrate the ability to pick out specific details and key information when listening to a range of speakers 4.2 Understand the main points and key details of a linguistically complex lecture or talk 4.3 Demonstrate the ability to predict the content of a conversation or speech, based on listening to a brief

	introduction or extract 4.4 Demonstrate the ability to utilise their listening skills in order to participate meaningfully in discussion of a broad range of issues

Syllabus			
Unit No	**Title**	**Proportion**	**Content**
Intermediate Level			
1	Globalisation	1/12 10 hours of class time 6 hours 25 minutes of private study	• Note taking • Vocabulary related to globalisation and the environment • Posters and leaflets • Debating • Giving and understanding opinions
2	Personality	1/12 10 hours of class time 6 hours 25 minutes of private study	• *have* as auxiliary and main verb • Discourse markers • Using a dictionary
3	Learning	1/12 10 hours of class time 6 hours 25 minutes of private study	• Narrative tenses • Education systems • Word building: abstract nouns • Understanding accents • Reading exam practice
4	History in the Making	1/12 10 hours of class time 6 hours 25 minutes of private study	• Borrowed words • Adverbial expressions • Historical films • Reading for detail • Interviews and questionnaires
5	Sound and Print	1/12 10 hours of class time 6 hours 25 minutes of private study	• Speculation and deduction • Adding emphasis • Inversion • Book and film reviews • Giving a presentation

6	Time and Money	1/12 10 hours of class time 6 hours 25 minutes of private study	• Distancing and hedging • Unreal past tenses • Vocabulary about time and money • Cohesive devices • Recognising accents • Designing a race around a city
7	Changes	1/12 10 hours of class time 6 hours 25 minutes of private study	• Conditional sentences • Compound adjectives • Giving a speech • Evaluating research • Writing a balanced essay
8	Interesting Ideas	1/12 10 hours of class time 6 hours 25 minutes of private study	• Permission, obligation and necessity • Verbs of the senses • Writing a report • A letter of complaint • IELTS writing
9	Mind and body	1/12 10 hours of class time 6 hours 25 minutes of private study	• Gerunds and infinitives • Future plans • Vocabulary in context • Homophones • Writing a discursive essay • IELTS speaking
10	Food	1/12 10 hours of class time 6 hours 25 minutes of private study	• Ellipsis • Compound and possessive nouns • Vocabulary about food • Writing questions • An authentic lecture
11	Home and Hobbies	1/12 10 hours of class time 6 hours 25 minutes of private study	• Adding emphasis • Cleft sentences • Commonly confused words • Word building • Intonation
12	The 21st Century	1/12 10 hours of class time 6 hours 25 minutes of private study	• Future changes and technology • Biographies • Vocabulary in context • Presentations • IELTS speaking

Assessment Type
Local Examination (100%)
See also Section 3 above

5.4   Study and Communication Skills

Title	Study and Communication Skills
Unit reference number	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 an 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
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
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
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

Journal-based Research for Essay Writing	• Journals and articles • Critical reading and analysing data • Describing data in an essay • Academic Style • Editing and proof reading • Public speaking practice and assessment
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
Writing a Research Report	• Approaching a task and making an assignment strategy • Understanding requirements and using criteria • Integrating evidence into a report • Editing and proofreading • Public speaking practice and assessment
Examinations and Assessment	• Writing summaries and reviewing notes • Preparing for exams • Time Management • Stress and anxiety management

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

5.5 Culture Studies

Title	Culture Studies
Unit reference number	J/615/0155
Credits	10
Level	3

Guided Learning Hours	45 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***

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

5.6 Foundation Mathematics

Title	Foundation Mathematics
Unit reference number	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***

Assessment Type
• Global Examination (100%)
See also Section 3 above

5.7   Introduction to Computer Science

Title	Introduction to Computer Science
Unit reference number	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***

Assessment Type
• Global Examination (100%)
See also Section 3 above

5.8   Introduction to Programming

Title	Introduction to Programming
Unit reference number	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***

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

PD_QUS_12 L3IFDHES Qualification Unit Specification v1.14

5.9   Introduction to Business

Title	Introduction to Business
Unit reference number	T/504/0966
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.Understand the purpose of businesses; their different forms, and the business environment	1.1 Identify different types of business 1.2 Explain why businesses exist e.g., profit, growth, survival, cash flow, social and ethical objectives 1.3 Assess what type of business would be suitable for what type of output 1.4 Identify the various stakeholders involved with a business 1.5 Understand how stakeholders can affect business activity 1.6 Review and assess an organisation's business objectives 1.7 Understand corporate social responsibility 1.8 Analyse the perceived negatives and benefits of socially responsible business behaviour
2. Understand people, processes, structures and change management	2.1 Identify different business department and their functions 2.2 Understand the structure of business and how that influences productivity and effectiveness 2.3 Understand why organisations develop layers of authority 2.4 Identify a range of leadership styles and select the most appropriate for change management 2.5 Explain change management tools and how they are used to manage change 2.6 Assess the importance of communication in a business 2.7 Use methods of communication to outline how to introduce change in a business 2.8 Describe a range of elements that can influence business culture and understand the role of culture during periods of change

3. Understand basic marketing principles in business	3.1 Use basic marketing principles
	3.2 Define and assess 'needs' and 'wants'
	3.3 Create a SWOT analysis for an organisation
	3.4 Review a range of market segment categories
	3.5 Explain and use market research and the marketing mix
	3.6 Review available marketing channels and select the most appropriate for a product
	3.7 Assess and devise appropriate marketing goals for a product
	3.8 Assess a range of marketing tactics and propose the most appropriate for a product
4. Understand production and the role of quality in business	4.1 Define 'production'
	4.2 Understand the steps necessary in a range of production processes
	4.3 Compare and contrast different production layouts
	4.4 Demonstrate the ability to select the most suitable production method for a particular product
	4.5 Explain why quality is important in business
	4.6 Explain the Kaizen method for quality control
	4.7 Analyse a production process and define how quality control can be implemented
5. Understand and analyse the business environment	5.1 Analyse the macro business environment using business tools such as PESTLE
	5.2 Determine activities that an organisation should pursue in light of analysis of its environment
	5.3 Analyse the risk arising from the business environment
	5.4 Understand how competition functions
	5.5 Understand the basics of market structure
	5.6 Understand common barriers to entry

Syllabus Content	
Topic	**Course Coverage**
Concepts of Business	• What Businesses are • What Businesses do
The Business Environment	• The Business Environment • Micro and Macro Environments • PESTLE analysis
Competition and Market Structure	• Competition • Market Structures
Business Ethics and Corporate Social Responsibility	• What are Business Ethics? • What is Corporate Social Responsibility?

Production and Quality – Production and Assembly Lines	• Product • Assembly Lines and Layouts • Operations Management
Production and Quality – Quality and Kaizen	• What is quality? • Why is quality important? • Quality inspection and quality assurance • Methods for managing quality e.g., TQM, Kaizen
People and Processes – Management and Leadership Styles	• Management • Managers and Leaders • Leadership Styles
People and Processes – Organisational Structure and Design	• Organisation Structure and Design
People and Processes – Culture and Change	• What is Culture? • What is Change? • Managing, Leading, and Communicating Change
Marketing – Marketing and Market Segments	• Marketing • Market Segments
Marketing – Market Research	• Market Research • Primary • Secondary
Marketing – Marketing Mix and SWOT	• The Marketing Mix • SWOT Analysis • Marketing tactics • Marketing planning

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

5.10 Introduction to Accounting and Economics

Title	Introduction to Accounting and Economics
Unit reference number	M/504/0965
Credits	10
Level	3

Guided Learning Hours	36 hours	**Total Qualification Time**	100 hours

Learning Outcomes The Learner will be able to:	Assessment Criteria The Learner can:
1. Understand the purpose of accounting and its importance to a business for sustainability and decision making	1.1 Understand how businesses use accounting for decision making 1.2 Understand the principles and purpose of accounting 1.3 Understand business sustainability 1.4 Use the analysis of financial performance and economic environment to propose business strategy 1.5 Understand how to develop business strategies that promote business sustainability
2. Understand core concepts of economics and their application for businesses in the real-world	2.1 Understand the main economic principles 2.2 Understand the difference between microeconomics and macroeconomics 2.3 Apply economic thinking to business decision making 2.4 Understand and use the concept of opportunity cost to propose business strategy 2.5 Understand the principle of the invisible hand 2.6 Apply and create supply and demand diagrams 2.7 Analyse the factors that influence supply and demand 2.8 Understand how much influence a business has on the price of its products
3. Analyse the financial health and performance of a business using information from financial statements and data	3.1 Interpret financial statements 3.2 Understand ratio analysis 3.3 Understand the importance of profit margins 3.4 Understand the importance of cash to a business 3.5 Analyse financial statements to establish the relative health of a business

Syllabus Content	
Topic	**Course Coverage**
How does accounting help in business?	• How accounting is used in record keeping. • How accounting is used in decision-making. • How accounting is useful in maintaining business sustainability. • Concept of profit.
Why is economics important for business?	• Relevance of economics to business. • Four core concepts of economics. • Differences between microeconomics and macroeconomics. • Applying economic thinking to business decision making.
Deciding what a business should produce	• Factors that influence supply and demand. • Creation and application of supply and demand diagrams. • Principle of the invisible hand. • The use of the concept of opportunity cost to propose business strategy.
Deciding when to produce products	• How economic systems influence timeliness. • How to analyse the economic environment. • The role of government in the economic system and environment. • Developing strategy concerning business decisions to produce a product.
Deciding how and where to produce the product	• How economic systems influence how and where to produce a product • How to analyse the economics environment • Analyse the factors that influence supply. • Apply economic thinking to business decision making.
Deciding where to sell the product	• How the economic environment impacts sales. • How factors that influence supply and demand impact on sales. • How much influence a business has on the price of its products. • Developing strategy concerning business decisions to sell a product.
Deciding on the type of business	• Types of business and their suitability for their purpose • Limited liability and how it relates to business ownership and control • The importance of share capital and business ownership • The profit motive

Understanding the business financially	• Assets, liabilities and capital • Income, expenses and appropriations • The content and presentation of a Statement of Financial Position • The content and presentation of an Income Statement
Business Survival and Growth	• The importance of cash to a business • The relationship between cash and profit • The role of credit in business • Business liquidity • The importance of solvency, insolvency and going concern • What is growth? and how to develop a growth strategy
Importance of profit	• The measurement of profit • Understanding investor needs • Understanding profit planning • Understanding how profits are divided between interested parties
Analysis of business performance	• Interpreting a financial statement • Understanding financial analysis • Understanding and analysing profit margins, liquidity, solvency, and business activity • Analysing financial statements to establish the relative health of a business
Establishing business health and growth	• Understanding how companies use accounting and economic information for decision making • Analysing financial statements to establish the relative health of a business • Analysing business performance from information in annual accounts • Understanding the analysis of financial performance and economic environment to propose business strategy

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

5.11. Further Mathematics

Title	Further Mathematics
Unit reference number	H/615/2415
Credits	10
Level	3

Guided Learning Hours	60 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Understand different techniques to solve cubic equations and write expressions in terms of their partial fractions	1.1 Find the quotient of a cubic equation when divided by a linear factor, using algebraic long division 1.2 Use the factor theorem to find roots of cubic equations 1.3 Convert rational functions into their partial fractions 1.4 Express improper fractions as partial fractions
2. Be able to work with complex numbers, perform arithmetic calculations using complex numbers, solve higher order polynomials with complex roots and sketch regions in the complex plane	2.1 Solve simple quadratic equations with complex roots by completing the square or using the quadratic formula 2.2 Represent complex numbers on an Argand diagram 2.3 Add, subtract, multiply and divide complex numbers 2.4 Calculate the modulus and argument of a complex number 2.5 Solve polynomial equations with real coefficients and complex roots, appreciating that such roots occur in conjugate pairs 2.6 Identify regions on Argand diagrams showing the area that represents solutions to inequalities involving complex numbers

3. Be able to perform arithmetic operations using matrices, understand basic transformations using matrices and, in addition, understand which matrices represent linear transformations and calculate the inverse of a matrix	3.1	Add and subtract matrices of the same dimension
	3.2	Perform matrix multiplication, demonstrating an understanding of non-commutativity and associativity
	3.3	Find the image of points in the x-y plane under given matrix transformations
	3.4	State whether a given transformation is a linear transformation and describe a transformation in terms of its effect on a column vector in two dimensions
	3.5	Find the 2x2 matrix which represents a given linear transformation or find the linear transformation represented by a given matrix
	3.6	Use matrix products to find matrices that represent combinations of two transformations
	3.7	Calculate the determinant of a 2x2 matrix and find the inverse if it exists
4. Understand the properties of rational functions and understand conic sections	4.1	Sketch the basic shape of quadratics, cubics, quartics, trigonometric functions and reciprocals, and understand the effect transformations have on the equations
	4.2	Sketch rational functions with a linear numerator and denominator, finding asymptotes and points of intersections with coordinate axes
	4.3	Sketch rational functions with two distinct linear factors in the denominator and repeated factors in the denominator
	4.4	Find stationary points on the graphs of rational functions
	4.5	Recognise the standard equations of parabolas, ellipses and hyperbolas in both Cartesian and parametric form and sketch the given equations, understanding the effects of transformations on the given equations
	4.6	Find the Cartesian equations of parabolas, given their focus and directrix
	4.7	Find the coordinates of the focus and an equation for the directrix of a parabola

5. Understand how to use sigma notation to calculate the sum of simple finite series, and appreciate the relationship between the roots of polynomials and their coefficients	5.1	Use the sigma notation, ∑ , to calculate the sum of simple finite series
	5.2	Use the formula for the sum of the first n natural numbers, and the sum of the squares and cubes of the first n natural numbers
	5.3	Use the method of differences to find the sum of a series
	5.4	Find the sum and product of the roots of a quadratic equation, and derive a quadratic equation given information about its roots
6. Understand further techniques in calculus to differentiate combinations of functions, how to use these techniques to solve problems involving functions given parametrically and how to derive Maclaurin and Taylor series	6.1	Use the chain rule, product rule or quotient rule to differentiate functions
	6.2	Covert parametric equations into Cartesian form
	6.3	Differentiate a curve whose equation is given parametrically
	6.4	Find the equations of tangents and normals of curves whose equations are given parametrically
	6.5	Use the chain and product rule to find second, third and higher order derivatives
	6.6	Derive and find the Maclaurin expansion of a given function in ascending powers of x
	6.7	Derive and use Taylor's series to expand a given function in ascending powers of x
7. Understand further trigonometry and hyperbolic functions	7.1	Solve problems involving trigonometric identities
	7.2	Understand and use compound angle formulae
	7.3	Understand and use the double angle formulae
	7.4	Write down the definitions of the hyperbolic functions, including the reciprocal hyperbolic functions
	7.5	Sketch the graphs of the main hyperbolic functions, including the reciprocal hyperbolic functions
	7.6	Solve equations using hyperbolic functions

8. Understand Euler's relation and De Moivre's theorem and derive relations between trigonometric functions and hyperbolic functions	8.1	Calculate the product and quotient of two complex numbers in polar coordinate form
	8.2	Derive Euler's relation and write complex numbers in exponential form
	8.3	Derive de Moivre's theorem and obtain formulae for $\sin n\theta$ and $\cos n\theta$ in terms of $\sin\theta$ and $\cos\theta$
	8.4	Use the exponential form of a complex number to derive relations between trigonometric functions and hyperbolic functions

Syllabus Content	
Topic	**Course coverage**
Cubic Polynomials & Partial Fractions	• Products of polynomials and equating coefficients • Algebraic long division • Factor theorem • Factorising cubic polynomials • Expressing rational functions in terms of their partial fractions, given: (a) Two linear factors in the denominator (b) A repeated root • How to express improper algebraic fractions in terms of their partial fractions ***Learning Outcome: 1***
Complex Numbers I	• Completing the square of quadratic trinomials • An introduction to complex numbers • Solving quadratic equations with complex roots • Representing complex numbers on an Argand diagram ***Learning Outcome: 2***
Complex Numbers II	• The modulus-argument form of a complex number • Solve further problems involving complex numbers • Solve polynomial equations with real coefficients • Loci in the complex plane • Inequalities with complex numbers ***Learning Outcome: 2***
Matrices	• An introduction to matrices including performing basic operations on matrices • Properties of matrix multiplication including non-commutativity and associativity • Finding and using the inverse of a matrix when it exists • Linear transformations ***Learning Outcome: 3***

Graphs of Rational Functions	• Sketching the basic shape of quadratics, cubics, trigonometric functions and reciprocals, understanding the effects of transformations of these graphs • Sketching rational functions with linear numerators and denominators, calculating any asymptotes • Finding any turning points on graphs of rational functions without using calculus ***Learning Outcome: 4***
Series	• Calculating basic arithmetic series • Use of sigma notation to calculate the sum of given series • Use of the formula for the sum of the first n natural numbers (including squares and cubes) • Method of differences ***Learning Outcome: 5***
Further Calculus Techniques I	• Further techniques in differentiation of more complex rational functions • Use of the chain rule, the product rule and quotient rule • An introduction to trigonometric identities and techniques to differentiate the trigonometric functions and their reciprocals ***Learning Outcome: 6***
Further Calculus Techniques II & Maclaurin and Taylor Series	• Binomial series expansion for $(1 + x)^n$ • Use of the chain and product rule to find second, third and higher order derivatives • Maclaurin series expansion of a given function in ascending powers of x • Taylor's series to expand a given function in ascending powers of x ***Learning Outcome: 6***
Trigonometric Identities & Hyperbolic Functions	• Solving trigonometric equations including solving problems using trigonometric identities • Definitions of hyperbolic functions and their graphs • Osborn's rule • Differentiating hyperbolic functions • Solving equations involving hyperbolic functions ***Learning Outcome: 7***
Euler's Relation and De Moivre's Theorem	• Compound angle identities • Products and quotients of complex numbers in polar form • Exponential form of complex numbers and Euler's formula • De Moivre's theorem • Relationships between trigonometric and hyperbolic functions ***Learning Outcome: 8***

Parametric Equations	• Drawing equations given parametrically by plotting points on the graph
	• Converting functions between their Cartesian form and parametric form
	• Differentiating curves given in parametric form
	• Tangents and normals to curves given parametrically
	• The second derivative
	Learning Outcomes: 6
Coordinate Systems	• An introduction to conic sections
	• The parabola and its transformations, including finding the equation of the parabola given its focus and directrix
	• The ellipse and its transformations
	• The hyperbola and its transformations
	Learning Outcome: 4

Assessment Type
• Global Examination (100%)
See also Section 3 above

5.12 Physics

Title	Physics
Unit reference number	K/615/2416
Credits	10
Level	3

Guided Learning Hours	43 hours	**Total Qualification Time**	100 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:	
1. Understand the mechanics of motion	1.1	Define and explain the relationships of displacement, velocity and acceleration
	1.2	Calculate average and instantaneous velocity and acceleration
	1.3	Solve problems involving equations of motion
	1.4	Demonstrate the use of motion equations for non-constant acceleration
	1.5	Describe the motion of objects in free fall and calculate their position and velocity
	1.6	Explain the importance of circular motion
2. Understand the mechanics of forces	2.1	Explain the concept of force and how it causes change in motion
	2.2	State and apply Newton's three laws of motion
	2.3	Apply Newton's laws in one-dimensional and circular motion
	2.4	Describe the conditions and calculate the forces necessary for equilibrium
3. Understand the mechanics of energy	3.1	Explain the meaning of work and find out the work done by constant forces
	3.2	Evaluate the work done by variable forces with position
	3.3	Define the concept of kinetic energy and state its relation to work
	3.4	Find out the relation between energy and power
	3.5	Define potential energy and calculate it dependent on conservative force as a function of position

4. Understand the mechanics of momentum	4.1	Explain the principle of momentum and conservation of momentum
	4.2	Describe the difference between inelastic and elastic collisions
	4.3	Find out the centre of mass for individual particles
	4.4	Calculate rotational kinetic energy
5. Understand the mechanics of periodic motion	5.1	Explain the simple harmonic oscillator
	5.2	Determine the maximum speed of an oscillator system
	5.3	Measure the acceleration of a simple pendulum due to gravity
6. Understand the basic principles of thermal physics	6.1	Explain the meaning of temperature and heat
	6.2	Describe the three phases of matter and find out the energies for phase change
	6.3	Calculate thermal expansion effects in solids, liquids and gases
	6.4	State the first law of thermodynamics and explain how thermal energy is involved in the conservation of energy principle
	6.5	Describe the effects of thermodynamic processes
	6.6	Define the specific heat of an ideal gas
	6.7	Explain the second law of thermodynamics and its limitations
	6.8	Calculate the efficiencies of heat engines and refrigerators
	6.9	Explain the meaning of, or calculate, entropy

7. Understand the fundamentals of electrostatics	7.1	Examine the behaviour of electric charge using Coulomb's law
	7.2	Explain the meaning of, or calculate, an electric field
	7.3	Explain Gauss's law for electric fields
	7.4	Explain the concept of electric potential difference
	7.5	Calculate the potential difference between two points in a simple electric field
	7.6	Calculate the electric potential for a point in the electric field of a point charge
	7.7	Describe charge distribution on conductors
	7.8	Explain the concept of capacitance
	7.9	Find out the capacitance of a parallel plate capacitor
	7.10	Calculate the equivalent capacitance of a combination of capacitors consisting of parallel and series capacitors
	7.11	Demonstrate how dielectrics make capacitors more effective
8. Understand the fundamentals of electrodynamics	8.1	Describe electric current and current density
	8.2	Describe electrical resistance
	8.3	Relate electrical current, voltage and resistance using Ohm's law
	8.4	Calculate electric power
	8.5	Draw a circuit with resistors in parallel and in series
	8.6	Explain the reason why the total resistance of a parallel circuit is less than smallest resistance of any of the resistors in the circuit
	8.7	Analyse a complex circuit using Kirchhoff's rules
	8.8	State the main functions of voltmeters and ammeters

9. Understand the fundamentals of magnetism	9.1	Describe the meaning of magnetic field, magnetic field lines and magnetic flux
	9.2	Calculate the motion of a charged particle in a magnetic field
	9.3	Explain the relation between magnetic fields and magnetic forces
	9.4	Calculate the magnetic field of a moving charge
	9.5	Calculate the magnetic field of a current element
	9.6	Calculate the force between parallel conductors
	9.7	Understand Ampere's law
	9.8	Calculate a magnetic field using Ampere's law
	9.9	Explain electromagnetic induction
	9.10	Calculate an induced electric field using Faraday's law

Syllabus Content	
Topic	**Course coverage**
Motion	• Definition of kinematics and dynamics • Displacement, time, velocity and acceleration • Equations of motion • Non-uniform motion • Free falling bodies and projectile motion • Circular motion ***Learning Outcome: 1***
Forces	• Types of forces • Newton's first law • Newton's second law • Newton's third law • Newton's second law applied in circular motion • Equilibrium ***Learning Outcome: 2***
Work and energy	• Work and kinetic energy • The work-energy conservation law • Power • Potential energy ***Learning Outcome: 3***

Momentum and collisions	• Linear momentum • Conservation of momentum • Collisions • Elastic collisions • Inelastic collisions • Centre of mass frame • Rotational kinetic energy ***Learning Outcome: 4***
Periodic motion	• Simple harmonic motion • Total energy of a harmonic oscillator • Importance of simple harmonic motion • Motion of a simple pendulum ***Learning Outcome: 5***
Thermal physics	• Temperature and heat • Thermal properties of matter • The first law of thermodynamics • The second law of thermodynamics ***Learning Outcome: 6***
Electrostatics I	• Electric charge and Coulomb's law • Electric field • Charge and electric flux • Gauss's law ***Learning Outcomes: 7***
Electrostatics II	• Electric potential • Conductors, capacitors and capacitance • Capacitors in series and parallel connection • Dielectrics ***Learning Outcome: 7***
Electrodynamics I	• Electric current • Resistivity and resistance • Electromotive force in electric circuits • Energy and power in electric circuits ***Learning Outcomes: 8***
Electrodynamics II	• Direct current circuits • Resistors in series and parallel • Kirchhoff's laws • Electrical measuring instruments ***Learning Outcome: 8***

Magnetism I	- Magnetic field, magnetic field lines and magnetic flux - Motion of a charged particle in a magnetic field - Magnetic force on a current-carrying conductor - Magnetic field of a moving charge - Magnetic field of a current element ***Learning Outcomes: 9***
Magnetism II	- Magnetic field of a current-carrying conductor - Force between parallel conductors - Ampere's law - Induction and Faraday's law - Induced electric field ***Learning Outcome: 9***

Assessment Type
• Global Examination (100%)
See also Section 3 above

5.13 Chemistry

Title	Chemistry
Unit reference number	R/616/8688
Credits	10
Level	3

Guided Learning Hours	52 hours	Total Qualification Time	100 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Understand atomic structure and bonding	1.1. Describe the basic structure of atoms. 1.2. Explain the different models of atomic structure. 1.3. Deduce the electronic configuration of atoms and ions. 1.4. Perform calculations using relative atomic mass and relative molecular mass. 1.5. Perform calculations using chemical formulae, balanced equations the mole and Avogadro Constant and molar volume. 1.6. Demonstrate titration techniques and solve associated calculations. 1.7. Identify and calculate experimental uncertainties. 1.8. Describe metallic and intramolecular bonding and properties. 1.9. Describe intermolecular bonding and properties. 1.10. Describe and predict the shapes of covalent molecules and polyatomic ions using the Valence Shell Electron Pair Repulsion (VSEPR) Theory.

2. Understand energetics, rates, kinetics and chemical equilibria	2.1	Define examples of standard enthalpy changes.
	2.2	Demonstrate that enthalpy change can be calculated from a potential energy diagram
	2.3	Explain how calorimetry can be used to measure enthalpy changes.
	2.4	Apply Hess's Law to calculations of enthalpy changes and bond enthalpy values.
	2.5	Describe, using collision theory, the effects of concentration, pressure, surface area (particle size), temperature and collision geometry on reaction rates.
	2.6	Define activation energy.
	2.7	Use energy distribution diagrams to explain the effect of temperature on reaction rate.
	2.8	Determine the order of a reaction from experimental data and rate equations.
	2.9	Calculate the rate constant and its units.
	2.10	Using the rate equation, predict the rate determining step and a possible mechanism.
	2.11	Describe the equilibrium chemistry of acids and bases.
	2.12	Construct equilibrium expressions.
	2.13	Explain and use the terms: pH, Kw, Ka and pKa.

3. Understand the key points of inorganic chemistry	3.1. State and explain the trends in melting and boiling points down a group and across a period.
	3.2. State and explain the trends in covalent radius across periods and down groups.
	3.3. State and explain the trends in ionisation energies across periods and down groups.
	3.4. State and explain the trends in electronegativity across periods and down groups.
	3.5. Understand the trends in the properties of oxides, chlorides and hydrides across the Periodic Table.
	3.6. Define the terms acidic, basic and amphoteric oxides, and know the reactions of some chlorides with water.
	3.7. Deduce the electronic configurations and oxidation states of transition metal atoms and ions.
	3.8. Explain what ligands are and how they bond in transition metal complexes.
	3.9. Explain and deduce coordination number in a transition metal-ligand complex.
	3.10. Name transition metal-ligand complexes according to IUPAC rules.
	3.11. Explain why some transition metal complexes are coloured.
	3.12. Understand how transition metals and their compounds can act as catalysts.

4. Understand functional groups, naming organic compounds and isomerism	4.1 Describe the concept of a functional group.
	4.2 Convert between molecular, structural and skeletal formulae of compounds with no more than ten carbons in length.
	4.3 Use the IUPAC nomenclature rules to name the following simple organic compounds: alkanes, alkenes, alcohols, aldehydes, ketones, carboxylic acids, esters and arenes (one benzene ring with one or more simple substituents).
	4.4 Interpret and use the general, structural, and skeletal formulae of the following classes of compound: alkanes, alkenes and simple arenes; haloalkanes; alcohols; aldehydes and ketones; carboxylic acids, esters and acyl chlorides.
	4.5 Explain that stereoisomers are isomers that have the same molecular formula but differ in structural formulae (a different spatial arrangement of their atoms).
	4.6 Understand that geometric isomers are stereoisomers where there is a lack of rotation around one of the bonds mostly a C=C.
	4.7 Explain that these isomers are labelled cis and trans dependent on whether the substitutes are on the same or different sides of the C=C.
	4.8 Recognise that optical isomers are non-superimposable mirror images of asymmetric molecules and are referred to as chiral molecules or enantiomers.
	4.9 Explain how isomers can often have very different physical or chemical properties from each other.
5. Understand organic synthesis reactions	5.1. Recognise and use different types of reaction in organic synthesis including substitution, addition, elimination, condensation, hydrolysis, oxidation and reduction.
	5.2. Devise synthetic routes, with no more than three steps, from a given reactant to a final product.
	5.3. Deduce the reactions that compounds can undergo by looking at their structures.

6. Understand aromatic (arene) chemistry	6.1. Describe and explain the structure, bonding and stability of the benzene ring.
	6.2. Name and draw various aromatic compounds.
	6.3. Describe substitution reactions of benzene: alkylation, nitration, sulfonation and halogenation as examples of electrophilic substitution in benzene and other aromatic compounds.
	6.4. Compare and contrast the electrophilic addition reaction used by alkenes, to the electrophilic substitution reaction used by benzene.
7. Understand the techniques used in organic analysis	7.1. Explain how mass spectrometry can be used to determine the accurate molecular mass and structural features of an organic compound.
	7.2. Explain how chromatographic techniques can be used to separate and identify components in a mixture.
	7.3. Explain how elemental microanalysis can be used to work out an empirical formula.
	7.4. Explain how infra-red spectroscopy can be used to identify certain functional groups in an organic compound and work out which compound is responsible for a spectra by identifying which functional groups are responsible for peaks.
	7.5. Explain how proton nuclear magnetic resonance spectroscopy (proton NMR) can give information about the different environments of hydrogen atoms in an organic molecule, and how many hydrogen atoms there are in each of these environments.

Syllabus Content	
Intermediate Level	
Topic	**Course coverage**
Atomic structure and stoichiometry	- Protons, neutrons and electrons; their relative charges and relative masses. - Protons, neutrons and electrons present in atoms, isotopes and ions given mass and atomic numbers and vice versa. - Development of the models of atomic structure from Rutherford, via Bohr to Quantum Mechanics. - Quantum numbers, atomic orbitals and relative energies. - Atomic orbitals, their shape and their relative energies. - Electronic configuration of atoms 1-20 in spectroscopic notation. - Application of chemical formulae to show the relationships between mass, moles, gram formula mass, Avogadro's constant, concentration and molar volume. - Simple acid-base titrations, back titrations, redox and complexometric titrations. - Uncertainties in experiments. ***Learning Outcome 1***
Chemical Bonding, Structure and Properties	- Metallic bonding - Electronegativity and the bonding continuum to distinguish between covalent and ionic bonds - Ionic and covalent intramolecular chemical bonding - Dative covalent bonding and properties in term of melting and boiling points. - Intermolecular chemical bonding ('van der Waals'): - London dispersion forces - Permanent dipole-permanent dipole interactions - Hydrogen bonding - Representations using 'dot-and cross' (Lewis) diagrams, shapes in some simple molecules and ions using Valence Shell Electron Repulsion (VSEPR) Theory ***Learning Outcome 1***
Periodicity in the Periodic Table	- Trends in melting and boiling points due to bonding. - Trends in covalent radius across periods and down groups of the Periodic Table. - Trends in ionisation energies across periods and down groups of the Periodic Table. - Trends in electronegativity across periods and down groups of the Periodic Table. ***Learning Outcome 3***

Transition Metal Chemistry	• Electronic configuration of transition metal atoms and ions. • Oxidation states of transition metals and ions. • Oxidation number during oxidation or reduction reactions. • Ligands in transition metal complexes • Coordination number. • Naming transition metal ligand complexes. • Transition metal complexes and colour. • Transition metals as catalysts. **Learning Outcome 3**
Chemical Energetics	• Enthalpy change (ΔH). • Calorimetry ($\Delta H = cm\Delta T$). • Applications of Hess's law, including Born-Haber Cycles. • Bond enthalpies **Learning Outcome 2**
Reaction-rates and Kinetics	• Collision theory. • Factors affecting the rate of a reaction. • Activation energy and the Maxwell-Boltzman energy distribution curve. • Order of a reaction (0, 1, 2, 3) from experimental data and rate equations. • Rate constants and units of k. • Rate equation, rate determining step and possible mechanism. **Learning Outcome 2**
Chemical Equilibria	• Equilibrium constant, k. • Composition of reaction mixtures, from the equilibrium equation. • Use of Kc and Kp values. • Types of chemical equilibria-homogeneous and heterogeneous. • Le Chatelier's principle. • Equilibrium and catalysts. • Definitions of acid, base, conjugate acid and conjugate base. • Kw, the ionic product of water. • Ka and the strengths of acids and bases. • Calculating the pH of solutions of strong acids and bases from [H+] and the pH of solutions of weak acids from Ka values. **Learning Outcome 2**

Organic nomenclature and isomerism	• Identification of organic compounds using functional groups.
	
	• Conversion between molecular, structural and skeletal formulae of compounds with no more than ten carbons in length.
	
	• IUPAC nomenclature rules for: alkanes, alkenes, alcohols, aldehydes, ketones, carboxylic acids and esters.
	
	• Optical isomers
	
	    o Identifying and drawing enantiomers (R and S) using wedges and dashes.
	
	    o Identification of chiral carbon centres.
	
	    o Identification using polarimeter
	
	• Geometric isomerism
	
	    o Formation of sigma and pi bonds on the C=C double bond (hybridisation may be used to explain bonding but will not be specifically examined).
	
	    o Identifying and drawing Cis and Trans isomers.
	
	    o Restricted rotation of the double bond to geometric isomerism.
	
	    o Boiling point features of Cis and Trans isomers.
	
	    o Compare and explain the melting point features of Cis and Trans isomers.
	
	Learning Outcome 4

Organic Synthesis Reactions- Part 1	• Preparation and reactions of alkanes. • Preparation and reactions of alkenes. • Preparation and reactions of haloalkanes. ***Learning Outcome 5***
Organic Synthesis Reactions- Part 2	• Preparation and reactions of alcohols. • Preparation and reactions of carboxylic acids and acyl chlorides. • Esters - preparation, uses, percentage yield and atom economy. • Preparation and reactions of aldehydes and ketones. ***Learning Outcome 5***
Aromatic Chemistry	• The structure, bonding and stability of the benzene ring. • Naming and drawing aromatic compounds (one benzene ring with one or more simple substituents). • How the pattern of electron density renders electrophilic attack the dominant reaction type in benzene. • Drawing and discussing the mechanisms for the following electrophilic substitution reactions: alkylation, nitration, sulfonation and halogenation. • Comparison of electrophilic addition reactions used by alkenes to the electrophilic substitution reaction used by benzene. ***Learning Outcome 6***

Organic Analysis	• Introduction to mass spectrometry.
	• Interpretation of the mass spectra of various simple organic molecules.
	• Chromatographic techniques.
	• Elemental microanalysis
	• Background to Infrared spectroscopy.
	• Infrared spectroscopy in structure determination (functional group identification).
	• Background on proton nuclear magnetic resonance (H-NMR).
	• Shielding and de-shielding related to the chemical shift values.
	• Use of tetramethysilane (TMS) as an internal standard.
	• Use of H-NMR in the determination of simple organic compound structure.
	Learning Outcome 7

Assessment Type
Global Examination (100%)
See also Section 3 above

5.14 Biology

Title	Biology
Unit reference number	Y/616/8689
Credits	10
Level	3

Guided Learning Hours	52 hours	Total Qualification Time	100 hours

Learning Outcomes; The Learner will:	Assessment Criteria; The Learner can:
1. Understand Cell Structure	1.1 Describe the components and function of cell membranes 1.2 Explain the movement of molecule and ions across cell membranes 1.3 Describe the main organelles found in human cells and explain their function 1.4 Explain how cell differentiation means cells are adapted for roles in the body
2. Understand the systems involved in the co-ordination and control of the body	2.1 Describe the structures and explain functions of the CNS and PNS. 2.2 Explain the transmission of impulses across synapses. 2.3 Describe the components of the Endocrine system. 2.4 Explain the concept of feedback loops, with examples form the human body. 2.5 Describe of hormones in controlling metabolism with Thyroxine as a named example. 2.6 Explain the of hormones in controlling the menstrual cycle during pregnancy. 2.7 Describe the structure and function of the eyes, ears nose (in relation so smell), mouth (in relation to taste) and the skin (in relation to sensory perception).

3. Understand the systems involved movement and energy release in the body	3.1	Describe the structure and explain the functions of the skeleton.
	3.2	Describe the structure and explain the functions of the three adult muscle types.
	3.3	Describe and explain the function, structure and components of human circulatory systems.
	3.4	Explain the specific function of the heart and how heart rate is governed.
	3.5	Describe the structure, function and control of the respiratory system.
	3.6	Explain gas exchange.
	3.7	Explain respiratory disease in relation to lung structure and function.
	3.8	Explain the production of energy using aerobic respiration and anaerobic respiration to meet the bodies energy requirements.
	3.9	Explain the use of different sources of energy in different circumstances, and how this helps the body to cope with a lack of food.
4. Understand how the body obtains the nutrients it needs and disposes of waste products	4.1	Describe and explain the structure of the digestive system.
	4.2	Describe and explain the digestive process which occur in the different areas of the digestive system with reference to enzymes and absorption.
	4.3	Explain the basics of excretion through the skin, digestive system and kidneys.
	4.4	Explain the sources and roles of macronutrients in the body.
	4.5	Explain the sources and roles of example micronutrients in the body.
	4.6	Link nutritional imbalance to disease.
5. Understand the body's defences against disease and infection	5.1	Describe and explain the bodies innate immune system.
	5.2	Describe and explain the bodies active immune system.
	5.3	Explain how vaccines work.
	5.4	Explain how immune system faults can cause illness.

6. Understand the process of reproduction	6.1 Explain cell division by mitosis, to produce genetically identical daughter cells.
	6.2 Explain cell division by meiosis to produce genetically distinct gametes
	6.3 Describe the main structures of the male and female reproduction systems.

Syllabus Content	
Intermediate Level	
Topic	**Course coverage**
Cell Structure	• Components and function of cell membranes • Movement across cell membranes • Cell organelles and their function • Cell differentiation for roles in the body, e.g. nerve cells ***Learning outcome 1***
Nervous System	• Structure and function of the CNS • Structure and function of the PNS • Transmission of impulses across synapses ***Learning outcome 2***
Endocrine System	• Components of the Endocrine system • Concept of feedback loops • Role of hormones in controlling metabolism • Role of hormones in controlling the menstrual cycle • Roll of endocrine system during pregnancy ***Learning outcome 2***
Sense Organs	• Structure and function of the eyes • Structure and function of the ears • Structure and function of the nose in relation so smell • Structure and function of the mouth in relation to taste • Sensory perception in the skin ***Learning outcome 2***
Skeleton System and Muscles	• Structure and role of the skeleton • Structure and function of the three adult muscle types ***Learning outcome 3***
Circulation	• The blood circulation systems. • The lymphatic circulation system • Comparative anatomy of blood vessels, and the reasons for these differences • Major blood vessels of the body and the key functions • Structure and function of the heart • Heart rhythms, blood pressure ***Learning outcome 3***

Respiration (gas exchange)	• The structure, function and control of the respiratory system. • Gas exchange. • Respiratory disease in relation to lung structure and function. ***Learning outcome 3***
Metabolism and Cellular Respiration	• Production of energy using aerobic respiration • Production of energy using anaerobic respiration • Uses of different sources of energy in different circumstances ***Learning outcome 3***
Digestion and Excretion	• Structure of the digestive system • Digestion and absorption in different areas of the digestive tract • Role of the liver in digestion and excretion • Role of the kidneys in excretion • Role of skin in excretion ***Learning outcome 4***
Nutrition	• Main food groups and their sources • Role of macronutrients in the body • Role of Micronutrients in the body • Diseases caused by diet ***Learning outcome 4***
The immune system	• Barriers to infection • The Innate immune system. • The Adaptive immune system. • Vaccination. • Hypersensitivity, anaphylaxis, autoimmune disease and immunodeficiency. ***Learning outcome 5***
Genetics and reproduction	• Cellular reproduction and growth • Meiosis and gamete production • Role of gametes in the mixing of genetic information • Structure of female reproductive organs • Structure of male reproductive organs ***Learning outcome 6***

Assessment Type
Global Examination (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 a fail in the unit and may resit.

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
Advanced English Language Skills	20	86	1720
Culture Studies	10	72	720
Developing English Language Skills	30	81	2430
English for Academic Purposes	10	88	880
Foundation Mathematics	10	93	930
Introduction to Business	10	90	900
Introduction to Accounting and Economics	10	90	900
Study and Communication Skills	20	82	1640
	120	**682**	**10120**
			10120/potential 12,000 = 84

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 relevant 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 1) and numerical marks. 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 and programmes.

8. Appendix 1 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 Developing English Language Skills

Learning Outcome	Pass	Merit	Distinction
Be able to communicate confidently, speaking on a range of familiar topics, using appropriate tenses, vocabulary and register	Demonstrate adequate level of communication	Demonstrate robust level of communication	Demonstrate highly comprehensive level of communication
Be able to comprehend the main content and overall meaning of a range of general texts in English	Demonstrate adequate level of comprehension	Demonstrate robust level of comprehension	Demonstrate high level of comprehension
Be able to write factual, descriptive and explanatory texts, utilising a range of linguistic structures and vocabulary, to complete clearly defined tasks	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to apply a range of listening strategies in order to understand predictable discussions and basic factual presentations	Demonstrate adequate and appropriate application	Demonstrate sound and consistently appropriate application	Demonstrate detailed and highly appropriate application

Grade descriptors for English for Academic Purposes

Learning Outcome	Pass	Merit	Distinction
Be able to utilise different 'pre', 'while' and post reading strategies to understand academic texts	Demonstrate adequate and appropriate use	Demonstrate appropriate and effective use	Demonstrate highly appropriate and effective use
Be able to demonstrate an appropriate academic vocabulary	Demonstrate an adequate vocabulary	Demonstrate a robust vocabulary	Demonstrate a comprehensive vocabulary
Be able to structure sentences, paragraphs and full texts to suit academic requirements	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to utilise 'pre', 'while' and post listening strategies to understand different speakers and academic topic information	Demonstrate adequate and appropriate use	Demonstrate appropriate and effective use	Demonstrate highly appropriate and effective use

Grade descriptors for Advanced English Language Skills

Learning Outcome	Pass	Merit	Distinction
Be able to communicate confidently, speaking on a range of familiar and unfamiliar topics, using appropriate tenses, vocabulary and register	Demonstrate adequate level of communication	Demonstrate robust level of communication	Demonstrate highly comprehensive level of communication
Be able to comprehend the main content and overall meaning of both general and more unfamiliar English texts	Demonstrate adequate level of comprehension	Demonstrate robust level of comprehension	Demonstrate high level of comprehension
Be able to write structured, factual, descriptive and explanatory texts, utilising complex linguistic structures and vocabulary	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Be able to apply a range of listening strategies in order to understand lengthy predictable discussions, factual presentations and more abstract conversations	Demonstrate adequate and appropriate application	Demonstrate sound and consistently appropriate application	Demonstrate detailed and highly appropriate application

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

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.	Provides critical interpretation and evaluation of relevant information and ideas to complete tasks and address well defined problems.	Provides consistently critical interpretation and evaluation of relevant information and ideas to complete tasks and address well defined problems.
Understand how the political and education system of a foreign country differs from their own	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 | 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 solutions | 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 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 | 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 Introduction to Accounting and Economics

Learning Outcome	Pass	Merit	Distinction
Understand the purpose of accounting and its importance to a business for sustainability and decision making	Demonstrates adequate knowledge and understanding of the subject matter	Demonstrates good knowledge and understanding of the subject matter	Demonstrates comprehensive knowledge and understanding of the subject matter
Understand core concepts of economics and their application for businesses in the real-world	Provides consistent interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems, and give appropriate justification for conclusions	Provides critical interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems, and give well explained and appropriate justification for conclusions	Provides consistently critical interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems, and give well explained and highly appropriate justification for conclusions
	Demonstrates adequate ability to review effectiveness of methods, actions, and results	Demonstrates sound ability to review effectiveness of methods, actions, and results	Demonstrates comprehensive ability to review effectiveness of methods, actions, and results
Analyse the financial health and performance of a business using information from financial statements and data	Can adequately identify, select, and use appropriate information and/or skills, methods, and procedures to reach appropriate conclusions	Can soundly identify, select, and use appropriate information and/or skills, methods, and procedures to reach well explained and appropriate conclusions	Can coherently identify, select, and use appropriate information and/or skills, methods, and procedures to reach well explained and highly appropriate conclusions
	Uses appropriate investigation and/or analysis of supplied information to inform conclusions	Uses detailed investigation and/or detailed analysis of supplied information to inform conclusions	Uses thorough and detailed investigation and/or consistently critical analysis of supplied information to inform well explained conclusions

Grade descriptors for Introduction to Business

Learning Outcome	Pass	Merit	Distinction
Understand the purpose of businesses, their different forms, and the business environment Understand people, processes, structures and change management Understand the basic marketing principles in business Understand production and the role of quality in business Understand and analyse the business environment	Demonstrates adequate knowledge and understanding of the subject matter Provides consistent interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems and give appropriate justification for choices/conclusions Demonstrates adequate ability to review effectiveness of methods, actions and results Can adequately identify, select and use appropriate information and/or skills, methods and procedures to reach appropriate conclusions Uses appropriate investigation and/or analysis of supplied information to inform actions/ conclusions	Demonstrates good knowledge and understanding of the subject matter Provides critical interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems and give well explained and appropriate justification for choices/ conclusions Demonstrates sound ability to review effectiveness of methods, actions and results Can soundly identify, select and use appropriate information and/or skills, methods, and procedures to reach well explained and appropriate conclusions Uses detailed investigation and/or detailed analysis of supplied information to inform actions/ conclusions	Demonstrates comprehensive knowledge and understanding of the subject matter Provides consistently critical interpretation and evaluation of relevant information and ideas to complete tasks, address well defined problems and give well explained and highly appropriate justification for choices/conclusions Demonstrates comprehensive ability to review effectiveness of methods, actions and results Can coherently identify, select and use appropriate information and/or skills, methods, and procedures to reach well explained and highly appropriate conclusions Uses thorough and detailed investigation and/or consistently critical analysis of supplied information to inform well explained actions/ conclusions

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 Further Mathematics

Learning Outcome	Pass	Merit	Distinction
Understand different techniques to solve cubic equations and write expressions in terms of their partial fractions	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Be able to work with complex numbers, perform arithmetic calculations using complex numbers, solve higher order polynomials with complex roots and sketch regions in the complex plane	Demonstrate ability to perform the tasks	Demonstrate ability to perform the tasks consistently well	Demonstrate ability to perform the tasks to the highest standard
Be able to perform arithmetic operations using matrices, understand basic transformations using matrices and, in addition, understand which matrices represent linear transformations and calculate the inverse of a matrix	Demonstrate ability to perform techniques	Demonstrate ability to perform techniques consistently well	Demonstrate ability to perform techniques to the highest standard
Understand the properties of rational functions and understand conic sections	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand how to use sigma notation to calculate the sum of simple finite series, and appreciate the relationship between the roots of polynomials and their coefficients	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand further techniques in calculus to differentiate combinations of	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques

functions, how to use these techniques to solve problems involving functions given parametrically and how to derive Maclaurin and Taylor series			
Understand further trigonometry and hyperbolic functions	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques
Understand Euler's relation and De Moivre's theorem and derive relations between trigonometric functions and hyperbolic functions	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand further techniques in calculus to differentiate combinations of functions, how to use these techniques to solve problems involving functions given parametrically and how to derive Maclaurin and Taylor series	Demonstrate adequate understanding of techniques	Demonstrate robust understanding of techniques	Demonstrate highly comprehensive understanding of techniques

Grade descriptors for Physics

Learning Outcome	Pass	Merit	Distinction
Understand the mechanics of motion	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the mechanics of forces	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the mechanics of energy	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the mechanics of momentum	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the mechanics of periodic motion	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the basic principles of thermal physics	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the fundamentals of electrostatics	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the fundamentals of electrodynamics	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the fundamentals of magnetism	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding

Grade descriptors for Chemistry

Learning Outcome	Pass	Merit	Distinction
Understand atomic structure and bonding	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand energetics, rates, kinetics and chemical equilibria	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand the key points of inorganic chemistry	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand functional groups, naming organic compounds and isomerism	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand organic synthesis reactions	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand aromatic (arene) chemistry	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding
Understand the techniques used in organic analysis	Demonstrate an adequate level of understanding	Demonstrate robust level of understanding	Demonstrate a highly comprehensive level of understanding

Grade descriptors for Biology

Learning Outcome	Pass	Merit	Distinction
Understand cell Structure	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the systems involved in coordination and control of the body	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the systems involved movement and energy release in the body	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand how the body obtains the nutrients it needs and disposes of waste products	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the body's defences against disease and infection	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the process of reproduction	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding