



QUALIFI

SUCCESS THROUGH LEARNING
RECOGNISED WORLDWIDE

Level 4 Diploma in Information
Technology

Level 4 Diploma in IT-Networking

Level 4 Diploma in IT-Web Design

Level 4 Diploma in IT-E-commerce

Specification (For Centres)

June 2019

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About QUALIFI

QUALIFI provides academic and vocational qualifications that are globally recognised. QUALIFI's commitment to the creation and awarding of respected qualifications has a rigorous focus on high standards and consistency, beginning with recognition as an Awarding Organisation (AO) in the UK. QUALIFI is approved and regulated by Ofqual (in full). Our Ofqual reference number is RN5160.

Ofqual is responsible for maintaining standards and confidence in a wide range of vocational qualifications. QUALIFI is also recognised by Qualifications in Wales (QW) and the Council for the Curriculum, Examinations and Assessment (CCEA) who are responsible for Awarding Organisations and quality assurance in both Wales and Northern Ireland. QUALIFI is also a signatory to BIS international commitments of quality.

As an Ofqual recognised Awarding Organisation, QUALIFI has a duty of care to implement quality assurance processes. This is to ensure that centres approved for the delivery and assessment of QUALIFI's qualifications and awards meet the required standards. This also safeguards the outcome of assessments and meets national regulatory requirements.

QUALIFI's qualifications are developed to be accessible to all learners in that they are available to anyone who is capable of attaining the required standard. QUALIFI promotes equality and diversity across aspects of the qualification process and centres are required to implement the same standards of equal opportunities and ensure learners are free from any barriers that may restrict access and progression.

QUALIFI's policy document for learners with specific requirements or who need special consideration is available for centre reference. Centres are responsible for reviewing the applicant's ability to complete the training programme successfully and ultimately achieve a qualification. The initial assessment by the centre, will need to take into account the support that is readily available or can be made available to meet individual needs as appropriate. The centre must also consider prior learning and qualifications and they must be in a position to make a judgement on the learner's entry requirements.

Supporting Diversity

QUALIFI and its partners recognise and value individual difference and have a public duty to promote equality and remove discrimination in relation to race, gender, disability, religion or belief, sexual orientation and age.

Learner Voice

Learners can play an important part in improving the quality of this course through the feedback they give. In addition to the ongoing discussion with the course team throughout the year, there are a range of mechanisms for learners to feed back about their experience of teaching and learning. This can include questionnaires and surveys to allow both centres and QUALIFI to understand how we can improve the learner experience.

Contents

Contents	3
1 Introduction	4
1.1 Why Choose QUALIFI Qualifications?	4
1.2 Employer Support for the Qualification Development.....	5
1.3 Qualification Title and Codes.....	5
1.4 Awarding Organisation	5
2 Qualification Purpose and Rationale	5
2.1 Purpose for the Qualifications.....	5
2.2 Rationale for the Qualifications.....	6
2.3 Aims of the Diplomas.....	6
2.4 Learning Outcomes of the Diploma.....	7
3. Delivering the Qualification	7
3.1 Quality Assurance Arrangements	7
3.2 Access to Study	8
3.3 Entry Criteria.....	8
4 Structure of the Qualification	9
4.1 Units, Credits and Total Qualification Time (TQT).....	9
4.2 Qualification Structures.....	10
4.3 Progression and Links to other QUALIFI Programmes	12
4.4 University Exemptions	12
4.5 Recognition of Prior Learning	12
5 Guidance to Teaching and Learning	13
6 Learner Support	13
6.1 Data Protection.....	13
7. Assessment	14
8. Course Regulations	15
8.1 Course Requirements	15
8.2 Classification of Awards.....	15
8.3. Learner Voice.....	15
8.4 Complaints	15
9 Equality and Diversity	15
10. Further Professional Development and Training	16
Appendix 1: Unit Descriptors.....	17
Unit 4IT01: Information Technology and Related Ethics.....	17
Unit 4IT02: Mathematics and Statistics for IT	19
Unit 4IT03: PC Maintenance and Operating Systems.....	22
Unit 4IT04: Computer Graphics Editing and Database Concepts.....	24
Unit 4IT05: Logical IT Networking.....	26
Unit 4IT06: Physical IT Networking.....	28
Unit 4IT07: Web Design	30
Unit 4IT08: Web Programming.....	32
Unit 4IT09: Graphical User Interface (GUI).....	34
Unit 4IT10: Programming Concepts and Java for Android Programming	36

1 Introduction

1.1 Why Choose QUALIFI Qualifications?

QUALIFI qualifications look to provide a realistic and broad opportunity for learners seeking career and professional development. They will support learners in realising their potential and provide clear objectives.

These objectives are to:

- provide career path support to learners who wish to develop their management skills, enterprise capabilities and opportunities in their chosen sector
- improve learner understanding of any given business environments and organisations and how they are managed and developed
- develop skills and abilities in learners to support their professional development.

Our qualifications provide a rich mix of disciplines and skills development opportunities. Learners will gain insight into the functioning, objectives and processes of organisations, appreciating their diversity and the influences and impact of external forces on them. The fast-changing and complex business environment and different organisational ability to stay resilient and respond positively to change and opportunities will be explored.

Our qualifications will develop learner ability to:

- apply analytical and evaluative techniques and to enhance those skills
- investigate issues and opportunities
- develop their awareness and appreciation of managerial, organisational and environmental issues
- use management techniques and practices in imaginative ways
- make use of relevant information from different sources
- develop and encourage problem solving and creativity to tackle problems and challenges
- exercise judgement and take responsibility for decisions and actions
- develop the ability to recognise and reflect on personal learning and improve their personal, social and other transferable skills.

1.2 Employer Support for the Qualification Development

The development of this qualification has been initiated and guided by discussions and idea sharing with a range of employers, providers and existing centres demonstrating the rigor, validity and demand for the qualification.

Discussions and feedback have been taken throughout the development of the qualification on content, the potential learner audience for the qualification and assessment methods, ensuring a valuable experience and a recognised set of skills, knowledge and understanding is realised.

1.3 Qualification Title and Codes

The qualification have been accredited to the Regulated Qualification Framework (RQF) and each qualification has its own unique Qualification Accreditation Number (QAN). This number will appear on the learner's final certification document. Each unit with the qualification has its own RQF code. The QANs for these qualifications are as follows:

QUALIFI Level 4 Diploma in Information Technology (603/4781/8)

QUALIFI Level 4 Diploma in IT-Networking (603/4782/X)

QUALIFI Level 4 Diploma in Web Design (603/4783/1)

QUALIFI Level 4 Diploma in E-commerce (603/4786/7)

1.4 Awarding Organisation

QUALIFI LTD

2 Qualification Purpose and Rationale

2.1 Purpose for the Qualifications

The purpose of the qualifications is to provide learners with the technical skills and knowledge needed to work in the information technology (IT) industry.

We hope that centres and learners take the opportunity to learn a great deal from this suite of qualifications that will provide relevant new skills and qualities.

It is envisaged that the qualifications will encourage both academic and professional development so that you learners move forward to realise not just their own potential but also that of organisations across a broad range of sectors.

The Diplomas are accredited at Level 4 and has a total equivalence of 120 credits.

2.2 Rationale for the Qualifications

The rationale for the qualification is that it provides a career path for learners who wish to develop a broad base of knowledge and skills that will enable them to work in a variety of roles in the IT industry, notably in Java programming, website design or PC maintenance. The technical skills and knowledge delivered through the successful achievement of the qualification are required and recognised internationally. It covers:

- IT and IT ethics
- mathematics and statistics for IT
- PC maintenance and operating systems
- computer graphics editing and database concepts
- logical and physical networking
- web design and programming
- Graphical User Interface (GUI)
- programming concepts and Java for Android programming

The rationale for the programmes is to provide a career path for learners who wish to develop their management and entrepreneurial capabilities within the business sector. The outcomes of the Diplomas, which are all recognised UK Qualifications, are for learners to develop the skills required by organisations globally.

2.3 Aims of the Diplomas

The qualifications provide the opportunity for individuals to forge a career in IT by seeking a greater knowledge and understanding of the industry, and to support the individual's development into technical positions. Overall aims include:

1. To enable learners to apply analytical and evaluative techniques to business in private and public sectors
2. To enhance analytical and evaluative skills relating to business across a number of industries
3. To develop the learner's ability to recognise and reflect on the process of personal learning and development, which facilitates the enhancement of key personal, sociable and other transferable skills
4. To encourage the learner's self-reflection, analytical, intellectual and transferable skills.

2.4 Learning Outcomes of the Diploma

The overall learning outcomes for all IT -related programmes are:

1. To understand and apply the principles of IT in a range of business environments
2. To understand and apply the principles in a specific environment
3. To improve the employability of learners by allowing them to explore the relationship between management theories and their practical application in the IT world.
4. Analyse problem solving techniques specific to business and industry
5. Select, collate, review and analyse information from a wide range of sources
6. Effectively use verbal and communication skills
7. Work independently and as part of a team
8. Manage one's own personal development and growth.

These are the overall learning outcomes in line with Level 4 equivalences. The learning outcomes for each unit are identified in Appendix 1 within the unit descriptors.

3. Delivering the Qualification

3.1 Quality Assurance Arrangements

All centres go through an approval process to be recognised as an approved centre. Centres must have in place qualified and experienced tutors. The experience of tutors and their ability to support learners will be important. Centres must commit to working with QUALIFI and its team of Quality Reviewers/External Verifiers. Continuing professional development (CPD) for tutors is also required.

Approved centres will be monitored by QUALIFI External Quality Reviewers (EQAs) to ensure that learners are provided with appropriate learning opportunities and guidance. EQAs will ask to see and discuss a centre's formative assessment plans. The suitability of these plans will be agreed with the centre.

QUALIFI's guidance on invigilation, preventing plagiarism and collusion will apply to centres. QUALIFI Quality Reviewers/External Verifiers will monitor centre compliance. For assessment purposes, unless otherwise agreed, QUALIFI:

- appoints assignment setters, markers and moderators
- sets and agrees assignments
- marks and moderates assignments
- agrees the final mark and issues certificates.

QUALIFI's 'Handbook on Guidance and Requirements for Assessment and Marking' will apply to its assignment setters, markers and moderators.

3.2 Access to Study

All learners should be invited to an induction event to be introduced to the programme in detail through presentations and discussions with tutors and the centre support team.

All learners should be issued with the Diploma handbook, a timetable and meet with their personal tutor and fellow learners. Centres should assess learners carefully to ensure that they take the right qualification and the right pathways or optional units, to allow them to progress to the next stage.

Centres should check the qualification structures and unit combinations carefully when advising learners. Centres will need to ensure that learners have access to a full range of information, advice and guidance in order to support them in making the necessary qualification and unit choices. When learners are recruited, centres need to give them accurate information on the title and focus of the qualification for which they are studying.

All learners must be registered with QUALIFI within 30 days of centre registration.

3.3 Entry Criteria

The qualifications have been designed to be accessible without artificial barriers that restrict access and progression. Entry to the qualifications will be through centre interview and learners will be expected to hold the following:

- demonstrated some ability and possess qualifications at Level 3, for example 'A' Levels or vocational awards;
- spent some time in an organisational role and shown they have capability and drive to develop
- seeking further professional development and to gain work related skills and know-how.

In certain circumstances, managers with considerable experience but no formal qualifications may be considered, subject to interview and being able to demonstrate their ability to cope with the demands of the programme.

In the case of applicants whose first language is not English, then IELTS 6 (or equivalent) is required. International Qualifications will be checked for appropriate matriculation to UK Higher Education postgraduate programmes. The applicants are normally required to produce two supporting references, at least one of which should preferably be academic.

4 Structure of the Qualification

4.1 Units, Credits and Total Qualification Time (TQT)

The QUALIFI Diplomas in IT are all Level 4 Qualifications made up of 120 credits.

All units are 20 credits in value. These units have been designed from a learning time perspective, and are expressed in terms of **Total Qualification Time (TQT)**. TQT is an estimate of the total amount of time that could reasonably be expected to be required for a learner to achieve and demonstrate the achievement of the level of attainment necessary for the award of a Qualification. TQT includes undertaking each of the activities of Guided Learning, Directed Learning and Invigilated Assessment. Each 20-credit unit approximates to a TQT of 200 hours incorporating 100 hours of Guided Learning.

Examples of activities which can contribute to Total Qualification Time include:

- guided learning
- independent and unsupervised research/learning
- unsupervised compilation of a portfolio of work experience
- unsupervised e-learning
- unsupervised e-assessment
- unsupervised coursework
- watching a pre-recorded podcast or webinar
- unsupervised work-based learning.

Guided Learning Hours (GLH) are defined as the time when a tutor is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. Guided Learning includes any supervised assessment activity; this includes invigilated examination and observed assessment and observed work-based practice.

Some examples of activities which can contribute to Guided Learning include:

- classroom-based learning supervised by a tutor
- work-based learning supervised by a tutor
- live webinar or telephone tutorial with a tutor in real time
- e-learning supervised by a tutor in real time
- all forms of assessment which take place under the immediate guidance or supervision of a tutor or other appropriate provider of education or training, including where the assessment is competence-based and may be turned into a learning opportunity.

4.2 Qualification Structures

There are ten units available. Each qualification requires core units to be taken and then elective units to determine which qualification is achieved. All units cover a number of topics relating to learning outcomes. Each unit has the equivalency of 20 credits.

Learners are required to complete 8 units to achieve the 120 credits required to gain any of the Level 4 Diplomas.

Learners will be expected to attend lectures and workshops that will introduce the subject matter. Formative assessments (weighted at 0%) may be used in lectures or tutorials to check knowledge and understanding of specific topics and subject areas.

Qualifi Level 4 Diploma in IT				
Learners must achieve all four core units and any two elective units* i.e. a total of 120 credits.				
Unit no.	Qualification unit title	Level	Credits	TQT
Core units				
4IT01	Information Technology and IT Ethics	4	20	200
4IT02	Mathematics and Statistics for IT	4	20	200
4IT03	PC Maintenance and Operating Systems	4	20	200
4IT04	Computer Graphics Editing and Database Concepts	4	20	200
Elective units				
4IT05	Logical IT Networking	4	20	200
4IT06	Physical IT Networking	4	20	200
4IT07	Web Design	4	20	200
4IT08	Web Programming	4	20	200
4IT09	Graphical User Interface (GUI)	4	20	200
4IT10	Programming Concepts and Java for Android Programming	4	20	200

* Learners would like to undertake the “Diploma in IT” cannot choose the combination of electives that lead to a specialise qualifications in Networking, Web design or E Commerce. Therefore, the following combinations are not allowed – 4IT05 and 4IT06, 4IT07 and 4IT08, 4IT09 and 4IT10 as the 2 electives.

Qualifi Level 4 Diploma in IT - Networking				
Candidates must achieve all four core units and two elective units i.e. a total of 120 credits				
Unit no.	Qualification unit title	Level	Credits	TQT
Core units				
4IT01	Information Technology and IT Ethics	4	20	200
4IT02	Mathematics and Statistics for IT	4	20	200
4IT03	PC Maintenance and Operating Systems	4	20	200
4IT04	Computer Graphics Editing and Database Concepts	4	20	200
Elective units				
4IT05	Logical IT Networking	4	20	200
4IT06	Physical IT Networking	4	20	200

Qualifi Level 4 Diploma in IT – Web Design				
Candidates must achieve all four core units and two elective units i.e. a total of 120 credits				
Unit no.	Qualification unit title	Level	Credits	TQT
Core units				
4IT01	Information Technology and IT Ethics	4	20	200
4IT02	Mathematics and Statistics for IT	4	20	200
4IT03	PC maintenance and Operating Systems	4	20	200
4IT04	Computer Graphics Editing and Database Concepts	4	20	200
Elective units				
4IT07	Web Design	4	20	200
4IT08	Web Programming	4	20	200

Qualifi Level 4 Diploma in IT – E-commerce				
Candidates must achieve all four core units and two elective units i.e. a total of 120 credits				
Unit no.	Qualification unit title	Level	Credits	TQT
Core units				
4IT01	Information Technology and IT Ethics	4	20	200
4IT02	Mathematics and Statistics for IT	4	20	200
4IT03	PC Maintenance and Operating Systems	4	20	200
4IT04	Computer Graphics Editing and Database Concepts	4	20	200
Elective units				
4IT09	Graphical User Interface (GUI)	4	20	200
4IT10	Programming Concepts and Java for Android Programming	4	20	200

4.3 Progression and Links to other QUALIFI Programmes

Learners completing any of the related **QUALIFI Level 4 Diplomas in IT** can progress to:

- the QUALIFI Level 5 Diplomas in IT;
- the second year of undergraduate study in Computer Science, Information Technology or related; or
- directly into employment in an associated profession.

4.4 University Exemptions

QUALIFI has exemptions for learners to progress to a number of universities to complete a master's degree. This generally requires completion of a dissertation only.

The pathways are an indication of a learner's progress towards a university degree and are based on the university's review of QUALIFI's learning programmes and outcomes. Further information is available here <http://www.QUALIFI.net/learning-pathways/>

4.5 Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether learners can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess, and so do not need to develop through a course of learning.

QUALIFI encourages centres to recognise learners' previous achievements and experiences whether at work, home or at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning. RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification.

Evidence of learning must be valid and reliable. For full guidance on RPL please refer to QUALIFI's policy document on RPL.

5 Guidance to Teaching and Learning

To ensure consistency and quality of delivery amongst centres, QUALIFI has outlined a number of policies and procedures required to ensure the very best standards are available to learners. These include:

- expertise of staff
- learning and teaching methods
- study skills
- learning resources
- personal development planning
- career opportunities.

The policies and procedures are available on request to all accredited centres or to those wishing to apply for accreditation to deliver QUALIFI qualifications.

6 Learner Support

Centres should continue to support learners and encourage appropriate behaviour. To ensure consistency and quality of delivery amongst centres QUALIFI, has outlined a number of policies and procedures to ensure the very best standards are available to learners. These include:

- learners with disabilities
- health and safety
- conduct
- progression
- weekly timetable/attendance requirements.

The policies and procedures are available on request to all accredited centres or to those wishing to apply for accreditation to deliver QUALIFI qualifications.

6.1 Data Protection

All personal information obtained from learners and other sources in connection with studies will be held securely and will be used during the course and after they leave the course for a variety of purposes. These should be all explained during the enrolment process at the commencement of learner studies. If learners or centres would like a more detailed explanation of the partner and QUALIFI policies on the use and disclosure of personal information, please contact QUALIFI via email support@QUALIFI-international.com

7. Assessment

These qualifications are vocational as they can support a learner's career progression. To meet QUALIFI's aim to provide an appropriate assessment method each unit will be assessed through tasks that will be written in a way to make them realistic 'work-related' tasks wherever possible. Learners will need to demonstrate knowledge, understanding and. Original thought, problem solving and recommendations on actions will also be asked for from learners where appropriate for the unit. Intellectual rigour will be expected appropriate to the level of the qualification.

Assignments will contain a question strand for each of the given unit's learning outcomes. The assignment tasks will address the LO (learning outcome) and AC (assessment criteria) requirements. Within assignments there will always be requirements for learners to engage with important and relevant theory that underpins the subject area.

The assignment questions will require learners to draw on real organisations to illustrate their answers. To support this activity during the programme of learning, centres are required to make sure that they include case studies of relevant organisations and, wherever possible, facilitate in-company opportunities for learners to undertake research and investigation projects and/or support the organisation with various tasks. Mature and part-time learners will ideally be able to draw on their personal work experience too.

Sample assessments and marking scheme are available on request as part of the Qualification Specification supplied to centres.

QUALIFI has an assessment policy and procedure documents that are available to all centres delivering this qualification. QUALIFI's 'Handbook on Guidance and Requirements for Assessment and Marking' covers the following:

- assessment strategy
- assessment arrangements for learners with a disability
- verification
- marking scheme/pass mark
- deferral after valid mitigating circumstances
- referral after failure
- dealing with difficulties in meeting assessment deadlines
- late submissions
- assessment boards
- appeals
- cheating and plagiarism
- referencing
- confidential material
- submission.

8. Course Regulations

8.1 Course Requirements

Learners must complete all units and pass the appropriate mark to receive the full Diploma Award.

QUALIFI will issue certificates to all successful learners through the registered centres.

8.2 Classification of Awards

All Diplomas are pass/fail. Where a candidate has achieved an overall average mark of at least 70% from all the units, QUALIFI may award a Distinction, although offering such a grade to individual candidates is at the discretion of QUALIFI and is not normally given after any successful referral attempts.

Decisions about the overall classification of awards are made by QUALIFI through the application of the academic and relevant course regulations. It is based on the Average Percentage Mark (APM) or, at the discretion of QUALIFI, on the basis of your overall profile and performance subject to the minimum requirements.

8.3. Learner Voice

Learners can play an important part in improving the quality of this course through the feedback they give. In addition to the ongoing discussion with the course team throughout the year, there is a range of mechanisms for learners to feed back about their experience of teaching and learning.

8.4 Complaints

QUALIFI recognises that there may be occasions when learners and centres have cause for complaint about the service received. When this happens, the complaints procedure is intended to provide an accessible, fair and straightforward system that ensures as an effective, prompt and appropriate response as possible.

For more information on our formal complaints procedure please contact in the first instance or email: support@QUALIFI-international.com

9 Equality and Diversity

QUALIFI recognises that discrimination and victimisation are unacceptable and that it is in the interests of QUALIFI employees to utilise the skills of the total workforce. It is our aim to ensure that no employee or other representative of QUALIFI receives less favourable facilities or treatment (either directly or indirectly) in recruitment or employment on grounds of age, disability,

gender/gender reassignment, marriage/civil partnership, pregnancy/maternity, race, religion or belief, sex, or sexual orientation (protected characteristics).

Our aim is that our workforce will be truly representative of all sections of society and each employee feels respected and able to give their best. We oppose all forms of unlawful and unfair discrimination or victimisation. To that end the purpose of this policy is to provide equality and fairness for all.

Our staff will not discriminate directly or indirectly, or harass customers or clients because of age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex, and sexual orientation in the provision of QUALIFI's goods or services.

This policy and the associated arrangements shall operate in accordance with statutory requirements, particularly the Equality Act 2010 <https://www.gov.uk/equality-act-2010-guidance>. In addition, full account will be taken of any guidance or codes of practice issued by the Equality and Human Rights Commission, any government departments, and any other statutory bodies.

The policy document will be monitored and reviewed annually and can be downloaded from our website or by making contact with QUALIFI.

10. Further Professional Development and Training

QUALIFI supports UK and international customers with training related to our qualifications. This support is available through a choice of training options offered through publications or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing learner-centred learning and teaching approaches
- building in effective and efficient quality assurance systems.

You can request customised training through your registered centre in the first instance. If you need to contact QUALIFI directly:

Our customer service number: +44 (0) 1158882323

Or email: support@QUALIFI-international.com

Website: www.QUALIFI.net www.QUALIFI-international.com

Appendix 1: Unit Descriptors

Unit 4IT01: Information Technology and IT Ethics

Unit code: L/617/6692

RQF Level: 4

Unit Aims

This unit aims to develop learners' knowledge and use of information technology including the use of standard office applications to prepare documents and presentations. This includes computer software and hardware, basic computer operations, application software, operating systems, information systems and IT-related issues in computing. The unit also seeks to provide learners with an awareness of ethical issues essential to an IT professional. This includes ethics in the cyberspace, intellectual property, privacy, the issue of security and reliability, how computing affects our health, professional code of ethics and how IT changes our daily lives.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand the applications of information technology	<ul style="list-style-type: none">1.1. Analyse the uses, strengths and limitations of different categories of hardware and software1.2. Analyse the applications of artificial intelligence (AI)1.3. Produce a specification of requirements for an application that meets the brief1.4. Create and present presentations that demonstrate an application layout using planning tools
2 Understand the ethics involved in information technology	<ul style="list-style-type: none">2.1 Analyse the nature of information technology ethics and its application to IT2.2 Analyse the analogy that relates ethics, morality and society2.3 Assess how and why information technology gives rise to ethical dilemmas not present in other technologies2.4 Evaluate the issues relating to IT ethics, justifying their conclusions

Indicative Content

- Today 's technologies: computers, devices, and the web
- Connecting and communicating online: The Internet, websites, and media
- Microsoft Office Word
- Computers and mobile devices: evaluating options for home and work
- Programs and apps: productivity, graphics, security, and other tools
- Digital security, ethics, and privacy: threats, issues, and defences
- Computing components: processors, memory, the cloud,
- Microsoft Office PowerPoint
- Input and output extending capabilities of computers and mobile devices
- Digital storage preserving content locally and on the cloud
- Operating system managing, coordinating, and monitoring resources
- Microsoft Office Excel
- Communicating digital content wired and wireless networks and devices
- Building solutions database, system, and application development tools
- Catalysts for change
- Introduction to ethics
- Networked communications
- Intellectual property
- Information privacy
- Privacy and the government
- Computer and network security
- Computer reliability
- Professional ethics
- Work and wealth

Recommended Text

Shelly, Cashman and Vermaat (2016) *Discovering Computers 2016 – A Gateway to Information*, Thomson Course Technology.

Quinn MJ (2016) *Ethics for the Information Age*, 7th edition, Pearson Education.

Breaux T (2015) *Introduction to IT Privacy: A Handbook for Technologists*, IAPP Publication.

Unit 4IT02: Mathematics and Statistics for IT

Unit code: R/617/6693

RQF Level: 4

Unit Aims

This unit aims to provide an opportunity to learn mathematics and statistics and equip learners with the mathematical skills to analyse and solve problems that will enable them to work within the field of IT. The unit covers number systems, logic, relations, functions, quadratic equations, quadratic functions, simultaneous equations, polynomial equations, exponential functions, logarithmic functions, coordinate geometry and matrices. The unit provides an opportunity to learn statistics and equip learners with the descriptive and analytical methods for dealing with variability in observed data. It covers graphical presentation of data, descriptive statistics, index numbers, correlation and regression, time series, probability and statistical inference.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1 Understand the mathematics underpinning information technology	1.1 Explain the nature of the roots of quadratic equations, the rules of exponents and logarithms and a function 1.2 Explain the relationship between a domain, range and function 1.3 Rewrite an exponential equation in logarithmic form and a logarithmic equation in exponential form 1.4 Compute maximum and minimum values of quadratic functions, composite functions, inverse functions, the area of a polygon, the equation of a straight line, locus, measures of central tendency and measures of dispersion and probability 1.5 Analyse the impact of quadratic inequalities, polynomial equations, exponential equations, logarithmic equations and simultaneous equations on hardware design

2 Understand the statistics underpinning information technology	2.1 Calculate summary measures correctly 2.2 Define and interpret probability models 2.3 Evaluate methods of estimation and hypothesis testing 2.4 Analyse the concepts of statistical methodologies
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Indicative Content

- Functions
- Quadratic equations
- Simultaneous equations
- Indices and logarithms
- Exponential and logarithmic equations
- Coordinate geometry
- Equation of straight line and locus
- Measures of central tendency
- Measures of dispersion
- Permutations and combinations
- Probability
- Probability distribution
- Descriptive and inferential statistics, variables, data types and collection, sampling
- Frequency distribution and presentation of data
- Measures of location
- Measures of dispersion, skewness and coefficient of variation
- Index
- Time series
- Probability
- Discrete probability distribution
- Normal distribution
- Confidence intervals
- Hypothesis testing
- Testing the difference between two means, two proportion
- Correlation and regression
- Chi-squared tests and quality control

Recommended Text

Lan Foo Huat, Yong Kien Cheng (2017) Essential SPM Additional Mathematics, Sasbadi

Wong Pek Wei, Dr. Wong Sin Mong (2016) Success Additional Mathematics SPM, Oxford Fajar

J.S. Ratti, Marcus S. McWaters (2015) College Algebra and Trigonometry, 3rd Edition, Addison Wesley

Judith A. Beecher, Judith A. Penna, Marvin L. Bittinger, (2016) Algebra and Trigonometry, 5th Edition, Addison Wesley

Allan G. Bluman (2015) Elementary Statistics A Step by Step Approach, 9th Edition, McGraw Hill

Prem S. Mann (2017) Introductory Statistics, 9th Edition, John Wiley & Sons

Allan G. Bluman (2017) Elementary Statistics A Step by Step Approach, 10th Edition, McGraw Hill

Unit 4IT03: PC Maintenance and Operating Systems

Unit code: Y/617/6694

RQF Level: 4

Unit Aims

This unit aims to provide knowledge of personal computer hardware. Successful completion of this unit will enable learners to install a computer system unit and operating system and conduct troubleshooting. The unit provides the essential knowledge of computer hardware, the software needed to make a hardware work, the components of the hardware and the technologies and principles that support the components. In addition to this knowledge, learners will be able to assemble computer hardware to build a full set PC, understand how to install the operation system and how to conduct troubleshooting in faulty hardware.

This unit also aims to provide the basic concepts about operating systems and to be able to install, configure and operate two commonly used operating systems. It includes an overview of Windows and Linux operating systems, the installation and configuration of these systems; the use of proper file systems; managing groups and users; installing and uninstalling applications on these two operating systems; operating basic command-line environment; manipulating simple files and printer-sharing.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand a range of operating systems	<ul style="list-style-type: none">1.1. Analyse the functionalities of PC hardware1.2. Install and commission a working personal computer to the required standard1.3. Optimize the operating system environment to the required standard1.4. Conduct troubleshooting to identify and solve common PC problems

<p>2. Understand Windows and Linux operating systems</p>	<p>2.5 Analyse the usage and role of an operating system</p> <p>2.6 Establish a disc operating environment that is appropriate to the required functionality</p> <p>2.7 Configure the Windows and Linux operating systems to the required standard</p> <p>2.8 Use common utilities and programs in the Windows and Linux operating systems correctly to configure file systems and to manage users and groups</p>
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Indicative Content

- PC hardware components and software requirements
- The operating system
- PC repair
- Form factors and power supplies
- Processor and chipsets
- Motherboard
- Memory
- Hard drives v fixed drives
- Input/output devices
- Multimedia devices and mass storage
- Installing and maintaining operation systems (Windows)
- Supporting and troubleshooting operation systems
- Functions, types and features of operating systems
- Microsoft Windows
- File and printer sharing
- Distribution, strengths and weaknesses of Linux, open sources and GPL
- Installation of Linux
- Operation of Linus
- Using applications in Linux
- Types of shell and fundamental shell command

Recommended Text

Wilson K (2018), Computer Hardware: The Illustrated Guide to Understanding Computer Hardware (Computer Fundamentals), Illuminated Press

Tanenbaum AS (2016), Modern Operating Systems, Pearson, India

Mueller S (2015) Upgrading and repairing PCs, 22nd Edition, Pearson India

Unit 4IT04: Computer Graphics Editing and Database Concepts

Unit code: D/617/6695

RQF Level: 4

Unit Aims

This unit aims to explain the concepts of photo editing. This will enable learners to insert photos into documents such as user manuals and the IT structure of an organization. The photos may need to be touched up before they are ready for use. This mainly involves using Adobe Photoshop and Adobe Illustrator for photo/image editing and designing. The unit delivers skills in photo retouching and digital drawing to address the issues of digital image design. It emphasizes exploration, techniques, media, ideas development and production techniques.

This unit also provides the fundamental concepts of a database system through Database Management System (DBMS), relational databases, entity relationship modelling and normalization. Learners are also required to create database systems using the database language of Structured Query Language (SQL).

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Use computer graphic editing techniques to edit photos and create illustrations	<ul style="list-style-type: none">1.1. Apply photo editing, retouching and repairing techniques correctly1.2. Use Photoshop correctly to create the required effects1.3. Create illustrations using illustration software tools to the required standard1.4. Analyse techniques to create movement in a graphical environment
3 Create a database system	<ul style="list-style-type: none">3.1 Define the concept of a relational database3.2 Build an entity-relationship diagram, deriving relations and validating relations using normalization3.3 Create a database using Data Definition Language (DDL) and manipulate a database using Data Manipulation Language (DML) that meets the specification

Indicative Content

- The work area, tools, options bar, other panels, customizing documents and workspace
- Working with selections
- Photoshop
- Photo corrections
- Layers
- Mask and channels
- Typographic design
- Selecting and aligning in Adobe Illustrator
- Creating and editing shapes including techniques to create movement in a graphical environment
- Transforming objects
- Drawing with pen and pencil tools
- Colour and painting
- Working with type
- Blending colours and shapes
- Preparing files for the web
- Data, information, database management, DMS and DAP
- Relational database
- Database Management System (DBMS)
- Structured Query Language (SQL) – Data Manipulation Language (DML)
- SQL – Data Definition Language (DDL)
- Entity relationship modelling
- Deriving ER Diagrams
- Normalization

Recommended Text

Adobe Team (2016), Adobe Photoshop CC Classroom in a book, Adobe Press.

Adobe Team (2017), Adobe Illustrator CC Classroom in a book, Adobe Press.

Thomas M. Connolly and Carolyn E. Begg (2015) Database Systems: A Practical Approach to Design, Implementation and Management, Edition: 6, Addison-Wesley.

Unit 4IT05: Logical IT Networking

Unit code: H/617/6696

RQF Level: 4

Unit Aims

This unit aims to provide learners with knowledge of logical networking. It covers Transmission Control Protocol (TCP) / Internet Protocol (IP), Local Area Networks (LAN) and Wide Area Networking (WAN), including IP address and subnetting.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand logical networking	1.5. Analyse the nature and features of a logical network 1.6. Analyse the differences between network architectures 1.7. Analyse the functionality of each layer in an OSI network model 1.8. Define correctly an IP address and subnet masks
1. Understand the components and interfaces between different logical networking attributes	3.4 Analyse the rules of network protocols and communications 3.5 Analyse the differences within the physical layer 3.6 Analyse the requirements of WAN and LAN topologies and a data link protocol 3.7 Analyse the differences within the network layer and transport layer 3.8 Establish network design considerations
2. Understand the security requirements of a logical network	3.9 Analyse the security requirements of a network 3.10 Identify the threats to a network 3.11 Develop security protocols for a logical network that respond to the threats identified

Indicative Content

- Exploring the network
- Network protocols and communications
- Network access
- Network layer
- Transport layer
- IP addressing
- Subnetting IP network
- Network design and consideration
- Device factors
- Designing network
- Scaling network
- Security threat
- Physical threat
- Primary vulnerabilities
- Network attacks
- Mitigating network attacks
- SSH configuration
- Backup and restore configuration

Recommended Text

Lowe D (2018), Networking All-in-One for Dummies 7th Edition, John Wiley & Sons, New Jersey

Cisco e-Learning portal (<http://cisco.netacad.net>).

Petzold C (2000), The Hidden Language of Computer Hardware, Microsoft Press, Washington

Unit 4IT06: Physical IT Networking

Unit code: K/617/6697

RQF Level: 4

Unit Aims

This unit aims to provide learners with knowledge of physical networking and basic network administration skills. It covers knowledge of computer networks.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
3. Apply the components of physical networking	1.9. Analyse the nature and requirements of a physical network 1.10. Analyse the requirements of different networking standards 1.11. Set up and configure LAN network devices to the required configuration
4. Understand the components and interfaces between different physical networking attributes	3.12 Analyse the requirements for the on-going maintenance of a physical network operating system 3.13 Assess the implications of different connectivity considerations 3.14 Analyse the purpose and implications of different protocols of the application layer
5. Install security protocols in a physical network	3.15 Install and configure a firewall to the required standard 3.16 Document actions taken in response to threats to security to the required standard 3.17 Determine the source and nature of threats to a network 3.18 Take action to mitigate identified risks that is appropriate to the nature and scale of the risk

Indicative Content

- Cabling and hardware standards
- Configuring a network operating system
- Ethernet
- Application layer

Recommended Text

Lowe D (2018), Networking All-in-One for Dummies 7th Edition, John Wiley & Sons, New Jersey

Cisco e-Learning portal (<http://cisco.netacad.net>).

McNab C (2016) Network Security Assessment: Know Your Network, 3rd Edition, O'REilly

Unit 4IT07: Web Design

Unit code: M/617/6698

RQF Level: 4

Unit Aims

This unit aims to provide learners with skills in website design and development. This includes techniques for writing web pages with Hypertext Markup (HTML) and Cascading Style Sheets (CSS).

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand the principles of website design	1.12. Analyse the requirements and stages of website design 1.13. Analyse the nature of the business for which a website is needed 1.14. Analyse the purpose and use of meta tags in website design 1.15. Analyse the techniques used in website design including those for attractiveness and ease of navigation 1.16. Analyse the requirement for testing using different platforms/browsers 1.17. Analyse the use of different content management systems
2. Design a website	3.19 Produce web pages using Hypertext Markup (HTML) and Cascading Style Sheet (CSS) 3.20 Produce a website design that is attractive and easy to navigate 3.21 Employ an interface between the website and corporate databases that is appropriate to the structure of a database and website 3.22 Analyse the payment and security requirements of a website 3.23 Select a payment system that is appropriate to the nature of a website 3.24 Ensure the website design works across different platforms/browsers 3.25 Respond creatively and practically to problems in website design to meet the brief

Indicative Content

- Domain names, URLs, TLD, markup languages, the website design and development process
- Hypertext Markup (HTML)
- Cascading Style Sheets (CSS)
- Visual elements and graphics
- Page layout
- Tables
- Forms
- Responsive web design
- Payment platforms and security requirements including SSL certification
- Content management systems
- Web promotion

Recommended Text

Terry Felke-Morris (2018) Web Development and Design Foundations with HTML5, Edition: 9, Pearson

Duckett J (2014), Web Design with HTML, CSS, JavaScript and jQuery Set, John Wiley & Sons, New Jersey

De Soto D (2014) Know Your Onions Web Design, bispublishers.nl

Unit 4IT08: Web Programming

Unit code: T/617/6699

RQF Level: 4

Unit Aims

This unit aims to provide learners with web programming knowledge and skills including advanced technologies to upload content onto the internet. Key components of the unit include the application of Personal Home Page (PHP) (Hypertext Pre-processor) and the integration of PHP with My Structured Query Language (MySQL) database.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand the concepts, tools and techniques underpinning web programming	1.18. Define the concept of server-side programming 1.19. Analyse the use of form elements in web programming 1.20. Analyse the use of modular programming 1.21. Analyse the stages of the database system development lifecycle
2. Carry out web programming	3.26 Install and configure Apache, PHP and MySQL to the required standard 3.27 Create web pages using PHP programming language that meet the specification 3.28 Produce dynamic web pages using PHP and MySQL that meet the specification 3.29 Build an interactive web-based application that meets the specification 3.30 Pass variables between pages in response to the specification

Indicative Content

- Stages of database system development lifecycle and the installation and configuration of AMP
- PHP syntax
- Passing variables between pages
- Connecting to MySQL server
- Using tables to display data
- Form elements
- Letting users edit the databases
- Regular expression
- Access control and personalization

Recommended Text

Gilmore, WJ, Kromann, F (2017) Beginning PHP 5 and MySQL 5 from Novice to Professional, Edition: 5, Apres

PHP Manual <http://www.php.net/doc.php>

Lockhart J (2015) Modern PHP: new features and good practices, Edition: 1, O' Reilly Media

Unit 4IT09: Graphical User Interface (GUI)

Unit code: D/617/6700

RQF Level: 4

Unit Aims

This unit aims to provide learners with Graphical User Interface (GUI) programming skills. This includes objects, methods and instance variables, problem solving concepts, programming languages and GUI programming. The main focus is on the design principles of GUIs, events handling, classes and interfaces, the use of layout managers, buttons, labels, lists, text fields and panels creation and manipulation, colours and font manipulation.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Understand the concepts, tools and techniques underpinning Graphical User Interface (GUI)	1.22. Define the concept of object-oriented programming 1.23. Analyse the characteristics of classes, methods, arguments, values and variables in object-oriented programming 1.24. Analyse the use and creation of an array
2. Create a GUI application using Java	3.31 Explain how to apply the syntactical rules of Java to create a GUI 3.32 Implement the GUI component classes 3.33 Write a GUI application that meets the brief 3.34 Test the effectiveness of the GUI against the requirements of the brief

Indicative Content

- Methods, arguments, values and method overloading
- Classes and objects
- Arrays
- GUI programming
- Layout managers
- NetBeans IDE using GUI Builder
- GUI components
- Graphics
- Mouse event and key event handling
- Advanced GUI applications

Recommended Text

Gaddis & Muganda (2018) Starting Out with Java: From Control Structures through Data Structures, 2 edition, Addison-Wesley

Lee Zhi Eng (2016) Qt C++ GUI Programming Cookbook: Design and build a functional, appealing and user-friendly graphical user-friendly graphical user interface, Packt Publishing, Birmingham, UK

Spolsky J and Winer D (2001) User Interface Design for Programmers, Apress, Berkeley, USA

Unit 4IT10: Programming Concepts and Java for Android Programming

Unit code: H/617/6701

RQF Level: 4

Unit Aims

This unit aims to develop programming skills. This unit includes variables, control and decision (if and switch) as well as loops and program control (for, while, do-while).

This unit also enables learners to develop software for Android telephones using Java development tools. The emphasis is on developing applications as a community that run on the Android platform. Successful completion of this unit will give learners an insight into today's common procedures for getting their mobile application work published.

Learning Outcomes and Assessment Criteria

Learning Outcomes: To achieve this unit, the learner must be able to:	Assessment Criteria: Assessment of these outcomes demonstrates the learner can:
1. Create a computer program	1.25. Define conditions, loops and program control 1.26. Use different kinds of control structures to create a program 1.27. Apply a range of techniques (data and expressions, classes and objects, conditions and decisions, loops and program controls and arrays) to create a computer program that meets the specification
2. Create an Android program	3.35 Create a responsive and touch-friendly user interface through the use of mobile user interface design techniques and standards 3.36 Apply a range of techniques (activities and layout, components, intent, toast, broadcast mechanism, service and storage) to create an Android program that meets the specification 3.37 Analyse the application of a range of development tools

Indicative Content

- Programming language, Java, program development and the Java Development Toolkit
- Java Development Tool, creating a Java application using console output and using GUI output
- Data and expressions
- Using classes and objects
- Condition and decision
- Loops and program control
- Method declaration, calling method, and passing parameters to method
- Arrays
- Types of Android API, development tools, Android Studio installation and configuration and update SDK
- Program structure
- Activities and layouts
- UI components and layout
- Intent and Intent filter
- Themes and styles
- Toast, notification and dialogbox
- Broadcast receiver
- Service
- Persistence storage (file and SQLite)
- Content providers
- Multimedia
- Sensors
- Publishing Android applications

Recommended Text

Gaddis & Muganda (2018) Starting Out with Java: From Control Structures through Data Structures, 4th Edition, Pearson

Bill Phillips, Chris Stewart, Kristin Marsicano (2017), Android Programming: The Big Nerd Ranch Guide (3rd Edition), Big Nerd Ranch Guides

Abazi B (2017) Android Development with Java: Step by step guide to build applications, learn2earn.academy