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Unit title:	Systems analysis and design
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Unit number:	8
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Level:	4
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Credit value:	15
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Guided learning hours:	60
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Unit reference number:	K/601/1281
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### **UNIT AIM AND PURPOSE**

This unit will enable learners to understand different systems' life cycles. They will understand the importance of a feasibility study, which will enable them to perform a systems investigation using appropriate systems analysis tools and techniques.

## **LEARNING OUTCOMES AND ASSESSMENT CRITERIA**

A pass grade is achieved by meeting **all** the requirements in the assessment criteria.

<b>Learning Outcome (LO)</b>	<b>Pass</b>  The assessment criteria are the pass requirements for this unit.
The Learner will:	The Learner can:
LO1 Understand different systems life cycles	1.1 evaluate different systems' lifecycle models  1.2 discuss the importance of following a procedural/staged lifecycle in a systems investigation
LO2 Understand the importance of a feasibility study	2.1 discuss the components of a feasibility report  2.2 assess the impact of different feasibility criteria on a systems investigation
LO3 Be able to perform a systems investigation	3.1 undertake a systems investigation to meet a business need  3.2 use appropriate systems analysis tools and techniques to carry out a systems investigation  3.3 create documentation to support a systems investigation  3.4 evaluate how user and systems requirements have been addressed

## **GRADING CRITERIA**

A merit grade is achieved by meeting **all** the requirements in the pass criteria **and** the merit descriptors.

A distinction grade is achieved by meeting **all** the requirements in the pass criteria **and** the merit descriptors **and** the distinction descriptors.

<b>Merit Criteria (M1, M2, M3)</b>	<b>Distinction Criteria (D1, D2, D3)</b>
(M1, M2, and M3 are mandatory to achieve a merit grade. Each must be achieved at least once per unit to achieve a merit grade.)	(D1, D2, and D3 are mandatory to achieve a distinction grade. Each must be achieved at least once per unit to achieve a distinction grade.)  (In order to achieve a distinction grade, all merit criteria must also have been achieved.)
<b>MANDATORY TO ACHIEVE A MERIT GRADE</b>	<b>MANDATORY TO ACHIEVE A DISTINCTION GRADE</b>
M1 Analyse concepts, theories or principles to formulate own responses to situations.	D1 Evaluate approaches to develop strategies in response to actual or anticipated situations.
M2 Analyse own knowledge, understanding and skills to define areas for development.	D2 Evaluate and apply strategies to develop own knowledge, understanding and skills.
M3 Exercise autonomy and judgement when implementing established courses of action.	D3 Determine, direct and communicate new courses of action.

## **TEACHING CONTENT**

The Teaching Content describes what has to be taught to cover **all** Learning Outcomes.

Learners must be able to apply relevant examples to their work although these do not have to be the same as the examples specified.

### **LO1 Understand different systems life cycles**

Design principle of different lifecycle models: inception, design, implementation, maintenance and review (a generalised systems development lifecycle) – all other models are based on this principle and learners should be aware of similarities as well as differences.

Lifecycle models	e.g. Waterfall (such as SSADM), spiral, unified process, Rapid Application Development (e.g. dynamic systems design methodology), Agile methods (whole lifecycle not just development), participative design and soft systems methodology
Phases	e.g. Waterfall approach of feasibility study, analysis, design, implementation, testing, review) or iterative and incremental approaches such as the unified process inception, elaboration, implementation, transition

Benefits of using a structured approach to development of commercial systems and explain the benefits and disadvantages of particular models (rigidity of Waterfall model, difficulties in scaling Agile methods).

### **LO2 Understand the importance of a feasibility study**

Requirements capture techniques	Semi-structured interviews, focus groups (including concepts such as soft systems methodology), survey instruments, observations (including the use of video observation), document analysis to help model feasibility of the project
Feasibility criteria	Learners should be aware of the wide range of issues they need to keep in mind, e.g. legal, social, economic, technical, timescales, organisational constraints, contingency planning and partial implementation
Structure of a feasibility report	Design (e.g. language style, intended audience, layout), purpose and elements (e.g. problem description, suggested solution financial implications). Also, learners should be aware of making arguments both in favour and against and reaching an evidence-based conclusion.

### **LO3 Be able to perform a systems investigation**

Requirements engineering	Requirements capture and specification (e.g. user and technical, both functional and non-functional) define scope, identify inputs and outputs, model processes affected by the new system, define quality assurance process and measures
Identify constraints	Organisation design and policies, integrating legacy systems, hardware platforms and technical architecture
Documentation	Structure (e.g. background information, problem statements, data collection process and summary, recommendations, appendices)
Analysis and design terminology and tools	Examples learners should be familiar with include use cases, activity diagrams, sequence diagram, UML, object modelling, data stores, entities, data flows; process map, relationships – One to one (1:1), One to many (1:n) and Many to many (n:m)
Types of investigation	Learners should be aware of the different focus in analysis and design projects involving upgrading an existing computer systems and designing a new system
Techniques	Examples include use cases, object modelling, domain modelling, data flow diagrams, entity-relationship modelling, quality assurance of processes (e.g. use of a capability maturity model) – learners should be able to identify techniques most associated with a chosen methodology.

### **GUIDANCE**

#### **Delivery guidance**

It will be beneficial to deliver this unit in a way that uses actual events, industry forecasts or sector specific contexts which offer the learner the opportunity to explore, develop and apply the fundamental principles of the sector or subject area. Typical delivery contexts could include the analysis and design of a new system in the learner's workplace.

Learners will benefit from being encouraged to exercise autonomy and judgement to identify a suitable potential piece of development work. To enable the learner to adapt their thinking and reach considered conclusions, the work needs to be properly analysed prior to development. The learner will need to decide the scope of the analysis project (based on a foundation of relevant knowledge, understanding and/or practical skill).

Learners would benefit from being presented with subject/sector-relevant problems from a variety of perspectives and from being given the opportunity to explore them using a variety of approaches and schools of thought. For example, the core differences in style between traditional analysis and design and agile methods.

### **Assessment evidence guidance**

Evidence must be produced to show how a learner has met each of the Learning Outcomes. This evidence could take the form of assignments, project portfolios, presentations or, where appropriate, reflective accounts.

Where group work/activities contribute to assessment evidence, the individual contribution of each learner must be clearly identified.

All evidence must be available for the visiting moderator to review. Where learners are able to use real situations or observations from work placement, care should be taken to ensure that the record of observation accurately reflects the learner's performance. This should be signed, dated, and included in the evidence. It is best practice to record another individual's perspective of how a practical activity was carried out. Centres may wish to use a witness statement as a record of observation. This should be signed and dated and included in the evidence.

## **RESOURCES**

### **Books**

Dennis A. and Haley Wixom B. *Systems Analysis and Design*, John Wiley & Sons Ltd, 2009. ISBN-10: 0470400315

Saltzinger, Jackson and Burd. *Systems Analysis and Design in a Changing World* (6<sup>th</sup> edition) 2012. ISBN-10: 1111972265, ISBN-13: 978-1111972264

### **Websites**

[www.agilealliance.org/](http://www.agilealliance.org/)

[www.freetutes.com/systemanalysis/](http://www.freetutes.com/systemanalysis/)

[www.methodsandtools.com/archive/archive.php?id=32](http://www.methodsandtools.com/archive/archive.php?id=32)

[www.dcs.bbk.ac.uk/~steve/1/](http://www.dcs.bbk.ac.uk/~steve/1/)