Topic 1—System fundamentals (20 hours)

1.1 Systems in organizations (10 hours)

	Assessment statement	Obj	Teacher's notes
Planning and system installation			
1.1.1	Identify the context for which a new system is planned.	2	The extent and limitations of a new system should be appreciated. Organizational issues related to the installation of new systems such as user roles, underlying technologies.
1.1.2	Describe the need for change management.	2	Students should understand there are a number of factors that need to be managed to ensure change is successful. **S/E** The way that change is managed can have significant effects on employers and employees.
1.1.3	Outline compatibility issues resulting from situations including legacy systems or business mergers.	2	**INT**, **S/E** When organizations interact, particularly on an international basis, there may be issues of software compatibility and language differences.
1.1.4	Compare the implementation of systems using a client's hardware with hosting systems remotely.	3	The benefits and drawbacks of SaaS (Software-as-a-Service) should be considered. **S/E**, **INT**, **AIM 8** The remote host may be in a different time zone and this can have significant effects on end-users.
1.1.5	Evaluate alternative installation processes.	3	Students should be aware of the methods of implementation/ conversion. Parallel running, pilot running, direct changeover and phased conversion. **S/E** Training issues may require organizations to restructure their workforce.
1.1.6	Discuss problems that may arise as a part of data migration.	3	**INT** These include incompatible file formats, data structures, validation rules, incomplete data transfer and international conventions on dates, currencies and character sets.

	Assessment statement	Obj	Teacher's notes
1.1.7	Suggest various types of testing.	3	The crucial importance of testing at all stages of implementation should be emphasized, with the stages clearly defined. Types of testing can include: user acceptance testing, debugging, beta testing. Students should be aware that there are programs that can test other programs, thereby automating parts of the testing process and reducing costs. **S/E** Inadequate testing can reduce employee productivity and lead to end-user dissatisfaction.
User focus			
1.1.8	Describe the importance of user documentation.	2	**S/E** The quality of user documentation can affect the rate of implementation of the new system.
1.1.9	Evaluate different methods of providing user documentation.	3	Examples should include methods such as: help files, online support and printed manuals. **S/E** The quality of user documentation can affect the rate of implementation of the new system.
1.1.10	Evaluate different methods of delivering user training.	3	Examples should include self-instruction, formal classes, remote/online training. **S/E** The quality of the delivery of user training can affect the rate of implementation of the new system.
System backup			
1.1.11	Identify a range of causes of data loss.	2	Causes include malicious activities and natural disasters. **S/E** Malicious activity may be a result of activities by employees within the organization or intruders.
1.1.12	Outline the consequences of data loss in a specified situation.	2	**S/E** Loss of medical records, cancellation of a hotel reservation without the knowledge of the traveller.

	Assessment statement	Obj	Teacher's notes
1.1.13	Describe a range of methods that can be used to prevent data loss.	2	These should include failover systems, redundancy, removable media, offsite/online storage.
Software deployment			
1.1.14	Describe strategies for managing releases and updates.	2	Students should be aware of a variety of ways in which updates and patches are made available and deployed. This includes automatic updates received on a regular basis online. **S/E**, **INT** Performance issues related to the inability to install updates may hinder end-users and reduce compatibility between systems in geographically diverse locations.

1.2 System design basics (10 hours)

	Assessment statement	Obj	Teacher's notes
Components of a computer system			
1.2.1	Define the terms: hardware, software, peripheral, network, human resources.	1	
1.2.2	Describe the roles that a computer can take in a networked world.	2	Roles include client, server, email server, DNS server, router and firewall.
1.2.3	Discuss the social and ethical issues associated with a networked world.	3	**AIM 8**, **AIM 9** Develop an appreciation of the social and ethical issues associated with continued developments in computer systems.
System design and analysis			
1.2.4	Identify the relevant stakeholders when planning a new system.	2	**S/E** The role of the end-user must be considered when planning a new system. Who is a relevant stakeholder? **TOK** Utilitarianism, the greatest good for the greatest number. The means justify the ends.

	Assessment statement	Obj	Teacher's notes
1.2.5	Describe methods of obtaining requirements from stakeholders.	2	Including surveys, interviews, direct observations. **AIM 5** The need for effective collaboration to obtain appropriate information from stakeholders. **S/E** The question of privacy for stakeholders.
1.2.6	Describe appropriate techniques for gathering the information needed to arrive at a workable solution.	2	Examining current systems, competing products, organizational capabilities, literature searches. **S/E** Intellectual property.
1.2.7	Construct suitable representations to illustrate system requirements.	3	Examples include: system flow charts, data flow diagrams, structure chart. UML is not required. **LINK** Flow chart symbols, flow charts and pseudocode.
1.2.8	Describe the purpose of prototypes to demonstrate the proposed system to the client.	2	**AIM 5** The need to effectively collaborate to gather appropriate information to resolve complex problems. **AIM 6** To develop logical and critical thinking to develop proposed systems.
1.2.9	Discuss the importance of iteration during the design process.	3	**MYP** Design cycle.
1.2.10	Explain the possible consequences of failing to involve the end-user in the design process.	3	**S/E** The failure to involve the end-user may lead to software that is not suitable for its intended use, which may have adverse effects on user productivity. **AIM 5** The need for effective collaboration and communication between the client, developer and end-user.
1.2.11	Discuss the social and ethical issues associated with the introduction of new IT systems.	3	**AIM 8**, **AIM 9** Develop an appreciation of the social and ethical issues associated with continued developments in specified computer systems.

	Assessment statement	Obj	Teacher's notes
Human interaction with the system			
1.2.12	Define the term usability.	1	**S/E** This includes ergonomics and accessibility.
1.2.13	Identify a range of usability problems with commonly used digital devices.	2	**S/E** Students should be aware of usability issues in a range of devices including PCs, digital cameras, cell phones, games consoles, MP3 players and other commonly used digital devices.
1.2.14	Identify methods that can be used to improve the accessibility of systems.	2	**S/E** Examples include touch screen, voice recognition, text-to-speech, Braille keyboard.
1.2.15	Identify a range of usability problems that can occur in a system.	2	**S/E** These should be related to the systems. Systems include ticketing, online payroll, scheduling, voice recognition, systems that provide feedback.
1.2.16	Discuss the moral, ethical, social, economic and environmental implications of the interaction between humans and machines.	3	**AIM 8** Raise awareness of the moral, ethical, social, economic and environmental implications of using science and technology.

Topic 2—Computer organization (6 hours)

2.1 Computer organization (6 hours)

	Assessment statement	Obj	Teacher's notes
Computer architecture			
2.1.1	Outline the architecture of the central processing unit (CPU) and the functions of the arithmetic logic unit (ALU) and the control unit (CU) and the registers within the CPU.	2	Students should be able to reproduce a block diagram showing the relationship between the elements of the CPU, input and output and storage. The memory address register (MAR) and memory data register (MDR) are the only ones that need to be included.
2.1.2	Describe primary memory.	2	Distinguish between random access memory (RAM) and read-only memory (ROM), and their use in primary memory.