St Maarten Academy Year Plan

CAPE Information Technology Unit 1

Sept 2023 – May 2024

Please note that a Spiral Approach will be used

Term 1

Week	Topic	Objectives/Sub-Objectives	Assessment
1	UNIT 1: INFORMATION TECHNOLOGY THEORY MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	describe the field of Information Technology *Scope of* Information Technology (*usage and limitations, related fields: Computing, Computer Science, Software Engineering, Computer Engineering, and Information Systems; commonalities and differences between disciplines).* Professional organizations (Institute of Electrical and Electronics Engineers [IEEE], British Computer Society [BCS], Association for Computing Machinery [ACM], and Association for Information Systems for completeness [AIS]).	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz
2	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	*outline the history of Information Technology;* *Brief history of computer hardware (categorized by size and processing ability) and software, Internet and telecommunications.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz

| 3 | MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY | *distinguish among data, information and knowledge;*

 Definition of terms; examples. Data: include unprocessed, unorganized and discrete (in separate, unrelated chunks), qualitative (opinion- based, subjective) or quantitative (measurement-based, objective), detailed or sampled.

 Information: including distortion, disguise, reliable, inconsistency, incomprehensible, subject to interpretation, value, relevance, confidentiality, timeliness, completeness, security, shareability, availability, lifespan, information as a commodity, format and medium.

 Knowledge: Use of information for decision making: data quality; appropriateness of data.

 Differences among data, information and knowledge. | Practical Assessment

 Case Study/Research Project/Practical Assessment/Online Quiz |
| 4 | MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY | *discuss various types of information sources;*

 Traditional and electronic information sources: including people, books, journals, catalogues, magazines, newspapers, libraries, CD-ROMs, DVDs, electronic databases, web sites, blogs, wikis, social media. | Practical Assessment

 Case Study/Research Project/Practical Assessment/Online |

		Primary and secondary information sources. *Advantages, disadvantages of information sources.* *End of Chapter Quiz*	Quiz
5	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	*identify characteristics of information sources;* *Include availability, cost, currency of information, amount of detail (depth), breadth of coverage, reliability, format and medium.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz
5	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	*describe the criteria for selecting information sources;* *Including: bias, accuracy, cultural context, completeness, currency of information, refereed and un-refereed sources, characteristics of information on the Internet.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
6	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	explain information processing; Definition of information processing *cycle* (input, process*ing*, output, s*torage, feedback*). *M*anual versus automated information processing: Input (data collection, capture or entry). Processing (collating, analysing, sorting, calculating). Output (presenting/dissemination); feedback. Storing/retrieving/transmitting (how, where, what, when). Feedback (optional evaluation or updates which loops to the input stage).	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		Examples of manual and automated information systems.	
6	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	identify ways of representing data and information; and, Data: including character, string, numeric, aural and visual. Information: including text, graphics, signals (*analogue, digital);* sound, video, special purpose notations (mathematical, scientific and musical notations); graphical representations (graphs and charts); tables. *Morse Code, musical symbols*, ASCII, (American Standard Code for Information Interchange); binary.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
	Internal Assessment - IA-SBA Outline	Discussion of Potential IA Projects	Selection and development of IA Research Topic
7	MODULE 1: FUNDAMENTALS OF INFORMATION TECHNOLOGY	justify the tools used in Information Technology. Hardware, (*for example modem*) software and communication tools; advantages and disadvantages; tools associated with the Internet including on- line services; search engines; *VoIP, SMS Discussion Forum/Board* telnet, ftp *(upload/download)*, message board, mailing list, *social media tools, web-conferencing* *tools, cross-platform messaging tools*.	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
		End of Module Quiz	Quiz

7	MODULE 2: INFORMATION SYSTEMS	describe Information Systems Definition; types of Information Systems. *Transaction Processing* Systems, Management Information Systems, Office Automation Systems/ Knowledge Work Systems, Decision Support Systems, Executive Information Systems)*.* *Expert systems definitions and examples;* *personnel; major input and output from each* *type of information system, such as data,* *information, processed transactions.* *Reports including detailed, summarised,* *exception, ad hoc.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
8	MODULE 2: INFORMATION SYSTEMS	*describe the relationship among the components in an Information System*; Relationship *among* the components: hardware, software, *data, procedures, users,* network.	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
8	MODULE 3: INFORMATION AND PROBLEM-SOLVING	explain the concept of problem solving; Problem-solving as a process; finding solutions to a problem. describe the stages of the problem-solving process; Stages: including define the problem, analyse the problem, identify and evaluate possible solutions, select and justify the optimal solution,	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		implement, and evaluate and review.	
9	MODULE 2: INFORMATION SYSTEMS	*describe the purpose, functions and types of hardware;* *Hardware (input, output, storage, processor and peripheral devices);*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
9	MODULE 3: INFORMATION AND PROBLEM-SOLVING	*identify* the information *necessary for the* solution of real-life problems; Identification of the information necessary for the solution of personal, commercial, scientific and social problems. Categorization of information as essential, desirable, extraneous or cosmetic in the solution of a problem.	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
10	MODULE 2: INFORMATION SYSTEMS	*describe the purpose, functions and types of software;* *Purpose, functions and types of software including application, system (operating systems, language translators, and utilities); software; embedded systems (monitoring and control systems);*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
10	MODULE 3: INFORMATION AND PROBLEM-SOLVING	explain *the criteria for selecting* information *that* can be used to solve real-life problems; Criteria for rejecting or accepting a piece of information, including bias, accuracy, cultural context, completeness, currency of information, refereed and un-refereed sources,	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		characteristics of information on the Internet.	
	Internal Assessment - IA-SBA Outline	End of Module 2 Quiz Discussion of Potential IA Projects	Quiz Selection and development of IA Research Topic
11	MODULE 2: INFORMATION SYSTEMS	*discuss the importance of data and information;* *Nature and structure of information at various* *decision making levels: strategic, tactical,* *operational; structured, semi-structured and* *unstructured.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
11	MODULE 3: INFORMATION AND PROBLEM-SOLVING	*distinguish among the different types of software development models;* *Waterfall approach, evolutionary development* *(prototyping), Agile software development,* *Iterative/Incremental approach (Usage,* *advantages and disadvantages).*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
12	MODULE 2: INFORMATION SYSTEMS	*distinguish among different types of HCI;* *Differences among the types of HCI including* *forms, menu, command line, natural language,* *graphical user interface (GUI), speech and direct* *manipulation*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
12	MODULE 3: INFORMATION AND PROBLEM-SOLVING	*explain the various stages of the system development life cycle (SDLC), and software engineering* *Including feasibility study, analysis, design,* *development, implementation, review;*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		deliverables/output of each stage including *system proposal, project plan, various diagrams and charts, information system (software) test plans, conversion plans, documentation including user and technical manuals.*	
13	Exams Internal Assessment - IA-SBA Development	End of Semester Exams Development of Potential IA Projects	Selection and development of IA Research Topic
13	Exams Internal Assessment - IA-SBA Development	End of Semester Exams Development of Potential IA Projects	Selection and development of IA Research Topic
14	Exams Internal Assessment - IA-SBA Data Collection	End of Semester Exams Data Collection of Potential IA Projects	Selection and data procedures development of IA Research Topic

Term 2 Jan – April 2024

Week	Topic	Objectives/Sub-Objectives	Assessment
1	MODULE 2: INFORMATION SYSTEMS	*evaluate different types of HCI;* *Basic principles and guidelines for evaluating* *HCI's: ease of use, ease of learning, ease of* *navigation, alignment, use of colour.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
2	MODULE 3: INFORMATION AND PROBLEM-SOLVING	*discuss the tools used in the different stages of the SDLC;* *Including questionnaires, interviews, observation, review/investigation of printed* *material, Entity Relationship (ER) diagrams, data* *flow diagrams, process models, object models,* *decision tables and trees, computer-aided* *software engineering (CASE) tools, GANTT* *charts, prototypes, flowcharts, pseudocode,* *programming languages.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
	Internal Assessment - IA-SBA Data Collection	Data Collection of Potential IA Projects	Selection and data procedures development of IA Research Topic
3	MODULE 2: INFORMATION SYSTEMS	*explain the roles of users;* *Inclusive of IT professionals, end users: expert* *users, novice users.* *Definitions and examples of users.* *describe ways in which a user's characteristics require adaptation* *of a user interface to increase effectiveness;* *Examples of user characteristics including age,*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		education, persons with disabilities (differently *abled) and cultural differences.* *Examples of user interface including non-visual* *interfaces, sensors, accessibility features,* *differences.*	
4	MODULE 3: INFORMATION AND PROBLEM-SOLVING	describe data flow diagrams (DFD); Define DFD; identify and describe the four symbols (elements); entity, process, data store, data flow; identify and describe the various levels of DFDs including context level and level 1 detailed DFD.	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
5	MODULE 2: INFORMATION SYSTEMS	*explain the purpose and functions of network components;* *Definition, purpose, functions, examples and* *types of networks including local area network* *(LAN), wide area network (WAN), metropolitan* *area network (MAN); virtual private network* *(VPN); mobile networks; Internet; Intranet;* *Extranet; configuration; topologies; transmission media: (wired versus wireless):;* *Wifi; hotspots; network security; firewalls.* *Communication modes (simplex, duplex, half* *duplex); receiver, sender, modulation,* *bandwidth; telecommuting, teleconferencing* *and videoconferencing.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
	Internal Assessment - IA-SBA Data Analysis	Data Analysis of Potential IA Project	Selection and data analysis and presentation of IA Research Topic

6	MODULE 3: INFORMATION AND PROBLEM-SOLVING	explain the concept of *a well-designed* algorithm;	Practical Assessment
		Definition; algorithm as a problem-solving strategy (a plan for a solution); its role and importance in the problem-solving process;	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
		Characteristics of a well-designed algorithm include a general solution to the problem in a finite number of steps, clearly defined and unambiguous, flow of control from one process to another.	
		End of Module 3 Exam	Module 3 Exam
7	MODULE 2: INFORMATION SYSTEMS	*describe networking standards;*	Practical Assessment
		Open System Interconnection (OSI) Model *Transfer Control Protocol/Internet Protocol (TCP/IP) Model.* *(Layer, protocol and function).*	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
8	MODULE 3: INFORMATION AND PROBLEM-SOLVING	identify ways of representing algorithms;	Practical Assessment
		Inclusion of natural language, flowcharts and pseudocode.	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
9	MODULE 2: INFORMATION SYSTEMS	design simple networks;	Practical Assessment
		Use diagrams to design *a simple* network (Standard Shapes for devices); routers, *switches,* hubs, Ethernet cables, Service Set Identifier (SSID), WAN, LAN, *firewalls, wired security,* wireless security: MAC filtering, WPA2, *WPA3,*	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		AES, password/network key, router password. IA Write up and Documentation	IA Documentation
9	MODULE 3: INFORMATION AND PROBLEM-SOLVING	develop algorithms to represent problem solution; *and,* Simple input, output, processing *statements or symbols.* *C*ontrol structures: sequence, selection, and repetition.	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
10	MODULE 2: INFORMATION SYSTEMS	*configure simple networks;* *Use designs to set-up and configure a simple* *network; network typology (bus, ring, star);* *routers, hubs, Ethernet cables, Service Set* *Identifier (SSID), WAN, LAN, firewalls, wired* *security, wireless security: MAC filtering, WPA2,* *WPA3, AES, password/network key, router* *password.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
10	MODULE 3: INFORMATION AND PROBLEM-SOLVING	*outline the interrelationship(s) between algorithms and programming.* Algorithms as precursor to program development. *Development of computer programs; stages in* *program development;* *programming* *paradigms; examples of* *programming* *languages.*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
11	MODULE 2: INFORMATION SYSTEMS	describe steps to troubleshoot a variety of wired and wireless network issues; Commands: Ipconfig, Ping, nslookup*; Speed test,*	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		Firewall configurations, IP address, DNS, Gateway, Physical connections, status lights.	
11	MODULE 2: INFORMATION SYSTEMS	compare the various features associated with the components of Information Systems;	Practical Assessment
		Features including, speed, efficiency, portability, maintainability, storage, transmission.	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
		End of Module 3 Exams	Module Exam
12	MODULE 2: INFORMATION SYSTEMS	compare various security mechanisms;	Practical Assessment
		Physical access control versus logical access control measures and devices; including passwords (characteristics of an effective password - not obvious, length, mixed case, alphanumeric); authentication, encryption, swipe or key cards, biometric; data integrity.	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
12	MODULE 2: INFORMATION SYSTEMS	explain the meaning of terms related to the security of *Information Systems;*	Practical Assessment
		For example, data security, passwords, authentication, encryption, data corruption.	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet
	IA Write Up First Draft Due	*Review of IA First Draft*	Corrections on IA First draft
13	MODULE 2: INFORMATION SYSTEMS	describe the structure of the internet as interconnected hypertext documents; and,	Practical Assessment
		Browser, hyperlinks, home page, World Wide	Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet

		Web (WWW), web page versus web site; Hypertext Transfer Protocol (HTTP), universal resource locator (URL), hypertext markup language (HTML), extensible markup language (XML); Domain Name Resolution (IP address, domain name).	
13	MODULE 2: INFORMATION SYSTEMS	develop simple webpages using HTML. HTML: document structure, elements, attributes; Headers, Text formatting, Paragraphs, Comments, Inline Styling (element attribute), Lists, Images, Tables, Forms, hyperlinks. End of Module 2 Exam	Practical Assessment Case Study/Research Project/Practical Assessment/Online Quiz/ Tutorial Sheet Module 2 Exam
14	Mock Exams Collection of IA Final Draft	Mock Exams Collection of IA Final Draft	IA Collection