

Scheme of work Computer Science

Academic year: 2022-2023

Term: I

School:

Subject: Computer Science

Teacher's name:

Class + Combination: S6MCE

Number of period per week: 7

Dates	Unit title	Lesson title + Evaluation	Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence	Teaching methods & techniques + Evaluation procedures	Resources & References	Observations
<p>Week1 26-30/9/2022</p>	<p>Unit-1: Computer Security</p>	<ul style="list-style-type: none"> • Why computer security? • Computer threats • Computer attacks • Source of virus and other attacks • Damage caused by threats • Threats protection and precaution 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Describe various kinds of attacks and security threats • Describe physical and logical security • Describe various security mechanism and tools <p>Skills</p> <ul style="list-style-type: none"> • Identify and distinguish among various security threats such as virus, Trojans, worms, spyware, Shoulder Surfing, Back door attack, Denial-of-Service attack, spoofing, eavesdropping, Social Engineering, Website Hacking • Apply computer security mechanism against computer threats and configure them properly <p>Attitudes and values</p> <ul style="list-style-type: none"> • Show concern on computer threats prevention and develop awareness on hardware and software security 	<ul style="list-style-type: none"> • Teacher will provide a computer infected by virus and ask students to detect and remove them • The teacher will ask students to write an essay on computer threats and their solutions 	<ul style="list-style-type: none"> • Internet • Book of computer S6 • Other documents 	

Key Unit Competency: To be able to Enumerate various security threats and ensure security of computers

<p>Week2 3-7/10/2022</p>	<p>Unit-2: LAN architecture, Network protocols and models</p>	<ul style="list-style-type: none"> • LAN architecture • Cable Ethernet standard • Fiber Distributed Data Interface 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Explain Ethernet LAN architectures • Identify wireless Ethernet standard • Explain steps to install and configure access point and set up security • Identify network layers, differentiate various protocols and devices user on each layer <p>Skills</p> <ul style="list-style-type: none"> • Explain IEEE 802.3 and carrier sense multiple access with collision detection • Able to install and configure router and connect a switch/ hub to a router with Physical router or in Network Simulator software • Describe different layers associate with each network model <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate the role of LAN architecture, Network protocols and models in computer network 	<ul style="list-style-type: none"> • Students look at their school's Local Area Network, physical devices if available. Teacher facilitates learners to identify the LAN architecture, different cables and wireless standard being used in school or nearby locations • Teacher provides wireless NIC to students and ask student to physically install the card in computer, download driver and configure it • Teacher provides multiple function device ,he shows students how to configure it and he asks students configure it in group work 	<ul style="list-style-type: none"> • Internet • Book of computer S6 • Other documents 			
<p>Week3 10-14/10/2022</p>		<ul style="list-style-type: none"> • Network devices • Computer Network protocols 						
<p>Week4 17-21/10/2022</p>		<ul style="list-style-type: none"> • TCP/IP model • Network Switching 						
<p>Key Unit Competency: To be able to identify computer network models, protocols and configure network devices</p>								

<p>Week 5 24-28/10/2022</p>	<p>Unit-3: Networking Project</p>	<ul style="list-style-type: none"> • Transmission medium • Networking tools 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Explain and develop step by step process of making peer to peer network and client/server network • Explain steps of making a wireless network using Wireless Access Point <p>Skills</p> <ul style="list-style-type: none"> • Recognize use of various networking tools to create network safely avoiding cuts, wounds and electrical shock • Allocate IP addresses to computers in network <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate the creation and configuration of computer wired and wireless network 	<ul style="list-style-type: none"> • Teacher will provide network cables, computers, network devices and ask students to build a computer network • Teacher will bring a laptop with inbuilt wireless and learners will configure Wi-fi to connect this Laptop to wireless internet • Teacher will provide a document copied in one computer and a printer connected on that computer. He asks students to share document and printer so that it can be accessible from remaining computers 	<ul style="list-style-type: none"> • Internet • Book of computer S6 • Other documents 	
<p>Week6 31/10-4/11/2022</p>		<ul style="list-style-type: none"> • IP address allocation • Data sharing • Evaluation 				
<p>Key Unit Competency: To be able to Build a computer wired and wireless network</p>						
<p>Week 7 7-11/11/2022</p>	<p>Unit-4: Structured Query language and Database Project</p>	<ul style="list-style-type: none"> • Relational algebra and relational calculus • Evaluation 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Identify and explain different operations of relational algebra and calculus <p>Differentiate among various queries used on data definition, data manipulation and data control languages</p> <p>Skills</p> <ul style="list-style-type: none"> • Create a database using data definition language using CREATE DATABASE Query 	<ul style="list-style-type: none"> • Teacher will suggest tables of a real life database and ask students to implement it using one of RDBMS • Using tables of database created above, teacher gives many questions and ask students to write down corresponding SQL commands and 	<ul style="list-style-type: none"> • Internet • Book of computer S6 • Other documents 	

			<ul style="list-style-type: none"> • Create a new table using CREATE TABLE query and Delete, modify, insert, update... an existing table. <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate the use of SQL queries to define, manipulate and control database 	<p>implement them using the computer</p> <ul style="list-style-type: none"> • Practical exercises on the use of relational algebra and relational calculus • Individual work on SQL queries manipulation • Setting of a practical exercises on database security 		
Week 8 14-18/11/2022	Unit-4: Structured Query language and Database Project (Cont')	<ul style="list-style-type: none"> • Structured Query language • Evaluation 	<p>Key Unit Competency: To be able to:</p> <ul style="list-style-type: none"> • Apply Structured Query Language in RDBMS <p>Create a short database project</p>	IDEM	IDEM	
WEEK 9 21-25/11/2022		<ul style="list-style-type: none"> • Data Definition Language • Data Manipulation • Data Control Language • Evaluation 				
Week10 28/11-2/12/2022		<ul style="list-style-type: none"> • Database security concept • Evaluation 				
Week 11 5-9/12/2022	Revision					
Week 12 12-16/12/2022	Examination period					
Week 13 19-23/12/2022	Preparing school reports					

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Dates	Unit title	Lesson title + Evaluation	Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence	Teaching methods & techniques + Evaluation procedures	Resources & References	Observations
Week 1 9-13/1/2023	Unit-5: Arrays, Functions and Procedures in Visual Basic	<ul style="list-style-type: none"> • Arrays (3P) • Functions (3P) • Evaluation (1P) 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Identify the importance of using array in the program • Identify the role of using each category of the function in the program • Give the syntax and step to write a function <p>Skills</p> <ul style="list-style-type: none"> • Differentiate Inbuilt function from user-defined function and their usage • Design and write a Visual Basic program using an array • Design and write a Visual Basic Program using a user defined and in-built functions <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate the use of Arrays and Functions in Visual Basic Program 	<ul style="list-style-type: none"> • Student is asked to interpret and generate output of a visual basic program containing arrays and functions concepts • Practical work on array declaration, initialization, entering and accessing array elements • Teacher gives exercise requiring students to apply arrays and functions concepts • Student is given the practical work related to user-defined function by converting different types of data one into another one and vice-versa • Teacher sets an exercise by which students declare, define and call a user function or a procedure 		
Week 2 16-20/1/2023		<ul style="list-style-type: none"> • Inbuilt functions (3P) • User-defined functions (3P) • Evaluation (1P) 				

Key Unit Competency: To be able to Use array, functions and procedures in Visual Basic program.

<p>Week 3 23-27/1/2023</p>	<p>Unit-6: Visual Basic Project</p>	<ul style="list-style-type: none"> • Requirement Analysis and Project Planning, Front end user interface in Visual Basic • Back end database in Ms-Access , MySQL or any suitable RDBMS • ODBC configuration • DAO, RDO and ADO objects in Visual Basic • ADODC, RECORDSET, ADDNEW, DELETE, UPDATE, MOVENEXT, MOVELAST, MOVEFIRST, MOVEPREVIOUS code in VB for data manipulation • Principals for designing a friendly and ergonomic user interface 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Describe Data Access Object (DAO), Remote Data Object (RDO) and Advanced Data Object (ADO) to establish connectivity between VB user interface and database • Describe Requirement Analysis and Project Planning • Describe steps of developing a visual basic project <p>Skills</p> <ul style="list-style-type: none"> • Configure Open Data Base Connectivity (ODBC) in administrative tools of operating system • Drag and Drop DAO/RDO or ADO object on form, establish, configure and test connectivity • Write code to insert, delete, update, search and display records from database through Visual Basic Interface • Analyze real life situation to plan and develop a short VB project with appropriate database connectivity <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate Visual Basic programming as strong tool to develop standard desktop 	<ul style="list-style-type: none"> • Teacher asks students to look around for a real life situation for which a project in Visual Basic can be developed. Learners do requirement analysis and develop a short Visual Basic project with database connectivity 		
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			applications with database connectivity.			
Key Unit Competency: To be able to connect Visual Basic Interface to Database and create a simple Visual Basic standard desktop applications for a real life situation						
Week 4 30/1-3/2/2023	Unit-7: Process Management and scheduling algorithm	<ul style="list-style-type: none"> • Process • Thread • Process Scheduling • Process Scheduling Algorithms 	Knowledge and understanding <ul style="list-style-type: none"> • Describe how operating system manages processes • Describe the role of threads in operating system management • Describe the process scheduling of Operating System • Describe different scheduling algorithms Skills <ul style="list-style-type: none"> • Identify states of a process • Differentiate a process, a program and a thread • Explain the different process scheduling algorithms Attitudes and values <ul style="list-style-type: none"> • Appreciate the role of operating system in process management and scheduling 	<ul style="list-style-type: none"> •Teacher will give students a diagram illustrating process management and ask student to interpret it. •Students will be asked to write an essay on Operating System Process Scheduling through research on internet and in books. •Students will be asked to interpret and comment on the different process scheduling algorithms 		
Key Unit Competency: To be able to:						
<ul style="list-style-type: none"> • Explain how processes are managed by Operating System • Understand process scheduling algorithms 						
Week 5 6-10/2/2023	Unit-8: File Management	<ul style="list-style-type: none"> • File • File types • File Access Mechanism • Space allocation 	Knowledge and understanding <ul style="list-style-type: none"> • Describe structure of file, type of files, mechanism of accessing files, and space allocation of a file in memory 	<ul style="list-style-type: none"> •Teacher will give exercises where students are required to manipulate files. •Students will be asked to write an essay about file types, file access mechanism and space allocation of files. 		

			<p>Skills</p> <ul style="list-style-type: none"> • Explain how file system manages computer hardware and computer software. • Explain type of files, mechanism of accessing files, and space allocation of a file in memory <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate file management done by operating system. 			
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Key Unit Competency: To be able to describe role of operating system in file management and explain file management

<p>Week 6 13-17/2/2023</p>	<p>Unit-9: Memory Management</p>	<ul style="list-style-type: none"> • Memory Type • Definition and Characteristics • Techniques of Memory management • Memory Allocation and release • Fragmentation: • Concepts of virtual memory, demand paging 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Explain characteristics of computer memory • Identify different mechanisms of memory management <p>Skills</p> <ul style="list-style-type: none"> • Describe main memory characteristics • Explain the techniques of memory management <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate how computer memory is managed by Operating System. 	<ul style="list-style-type: none"> • In a group, students will be asked to discuss about characteristics of memory and techniques of memory management. 		
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Key Unit Competency: To be able to explain the role of operating system in Memory Management

Week 7 20-24/2/2023	Unit-10: Collections in Java	<ul style="list-style-type: none"> • Collections • Definition • Creation of List instances using ArrayList 	Knowledge and understanding <ul style="list-style-type: none"> • Describe data structures or types (e.g. linked lists, trees, stacks, queues, sets, maps). • Differentiate algorithms used different collection classes 	<ul style="list-style-type: none"> • Students create classes and encapsulates their instance variables by making them private and create their respective getter and setter then create another class with main method to create instance and add these objects to a collection (List, map, set). 		
Week 8 27/2-3/3/2023		<ul style="list-style-type: none"> • Hashset • HashMap • LinkedList • Queue • Stack • Tree 	Skills <ul style="list-style-type: none"> • Create a collection using Set, List, Queue and Map collection classes and iterate elements stored in collection • Put a list of a given elements in a tree nodes. • Use appropriate methods to access objects stored in Queue, Stack and Tree Attitudes and values <ul style="list-style-type: none"> • Choose appropriate collection to store objects 			
Key Unit Competency: To be able to use collections to store data in Java						
WEEK 9 6-10/3/2023	Unit-11: J2EE web applications	<ul style="list-style-type: none"> • Tomcat • HTTP Request • HTTP Response • Web application 	Knowledge and understanding <ul style="list-style-type: none"> • Describe the stages of the software development process • Identify the use of features namely Scriptlet, Expression, Directive, Declaration and Comments in JSP 	<ul style="list-style-type: none"> • Students access tomcat administration page through port 8080, explore built-in webapps, stop and start tomcat, locate the configuration folder and manage tomcat-user.xml file • Students use NetBeans IDE to create Dynamic J2EE Application containing packages for classes and servlet, images and css folders and locate views 		
		<ul style="list-style-type: none"> • Installation and configuration of tomcat • Configuration directory • Manage web applications • URL • Components of URL 	Skills <ul style="list-style-type: none"> • Configure and manipulate tomcat web server. 			

Week 10 13-17/3/2023		<ul style="list-style-type: none"> • Static and dynamic web pages • Java Servlet pages • Java Standard Tag Library • JDBC Connection • Software design process 	<ul style="list-style-type: none"> • Create a dynamic web application using JSPSERVLET • Design a form in JSP pages and access values in servlet using request methods like getParameter. <p>Attitudes and values</p> <ul style="list-style-type: none"> • Appreciate the use of controller to link user's views and the database. • Enjoy interaction with database through dynamic web application 	<p>inside WEB-INF and access them using a controller/servlet.</p> <ul style="list-style-type: none"> • Students design a HTML form in JSP pages and access 		
Key Unit Competency: To be able to Design and run a J2EE web application						
WEEK 11 20-24/3/2023	Examination period					
WEEK 12 27-31/3/2023	Preparing school reports					

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Dates	Unit title	Lesson title + Evaluation	Learning objectives (copied or adapted from the syllabus depending on the bunch of lesson) + Key unit competence	Teaching methods & techniques + Evaluation procedures	Resources & References	Observations
Week 1 17-21/4/2023	Unit-12: Introduction to Computer Graphics	<ul style="list-style-type: none"> • Digital Camera • Using scanner to capture images, setting resolution 	Knowledge and understanding <ul style="list-style-type: none"> • Describe parts and functions of a digital camera, Scanner as image capturing tool 	<ul style="list-style-type: none"> • Teacher helps learners to define computer graphics related items. • Learners do photo shoot with a digital camera to be familiar with all operation 		
Week 2 24-28/4/2023		<ul style="list-style-type: none"> • Definitions • Areas of Graphics use 	<ul style="list-style-type: none"> • Explain computer graphics related terms • State different graphics file format. Skills	<ul style="list-style-type: none"> • Learners use scanner to capture some images from papers. • Students are given a sample of every type of graphics and they resize them and discuss and compare the different type. 		
Week3 1-5/5/2023		<ul style="list-style-type: none"> • Graphics software • Basic Graphic elements 	<ul style="list-style-type: none"> • Use Digital camera and scanners in everyday life with all functions available 	<ul style="list-style-type: none"> • Teacher demonstrate Ms-Paint, Ms-Office Picture 		

Week4 8-12/5/2023		<ul style="list-style-type: none"> • Graphic features and editing tools • Tools in Photoshop 	<ul style="list-style-type: none"> • Demonstrate the difference between vector graphics and bitmap graphics • Creating vector graphics and bitmap graphics using basic graphic elements 	manager and Adobe Photoshop to create and edit graphics images and learners do hands-on exercises in these software		
Week5 15-19/5/2023			Attitudes and values <ul style="list-style-type: none"> • Appreciate the use of camera and scanners as digital image capturing tool • Appreciate the use graphics to improve data presentation • Enjoy the way graphics is used to improve the appearance. 			
Key Unit Competency: To be able to Describe computer graphics terminology, create, capture graphics images and edit them using software						
Week 6 22-26/5/2023	Unit-13: Multimedia	<ul style="list-style-type: none"> • Introduction (Definition, different types of media,...) • Interactive multimedia power point presentation 	Knowledge and understanding <ul style="list-style-type: none"> • Describe the procedure to capture and represent digital sound using discrete levels of amplitude in sound wave • Describe the procedure of movie-making in term of frames, frame rate, flikers • Identify the media tools used to create images, audio and video files appropriately 	<ul style="list-style-type: none"> • Teacher helps learners to understand and explain the multimedia tools and applications • In small groups, teacher facilitates students to create hyperlinks • Students in groups use media tools to capture images, video, audio or search images on the internet to create an interactive media files 		
Week 7 29/5-2/6/2023		<ul style="list-style-type: none"> • Create action buttons • Digital Audio recording and Editing 	Skills <ul style="list-style-type: none"> • Explain different multimedia tools and applications • Create an interactive power point presentation 	<ul style="list-style-type: none"> • Learners create a multimedia power point presentation • Learners record audio files using microphone and edit them in audio editing software • Learners record video files using mobile camera, handy 		

			<ul style="list-style-type: none"> Use software to edit and bind digital images, audio and video data together to form an effective multimedia content 	camera and edit them in video editing software		
Week 8 5-9/6/2023		<ul style="list-style-type: none"> Animations 	<p>Attitudes and values</p> <ul style="list-style-type: none"> Appreciate the effectiveness of multimedia tool and applications. Appreciate the effectiveness of video data in real life as a set of thousands of continuous images and associated sound Creativity and appreciation of media in society 			
<p>Key Unit Competency: To be able:</p> <ul style="list-style-type: none"> Explain the different use of multimedia and interactive multimedia applications Use multimedia software to create video. 						
Week 9 12-16/6/2023	Unit-14: File handling in C++	<ul style="list-style-type: none"> Types of Files: (Plaintext file, binary files) File Streams 	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> Describe concept of File Streams, Input/ Output as stream Describe steps and syntax to open, close files, write or read data from files <p>Skills</p> <ul style="list-style-type: none"> Create Files in C++, open and close files in appropriate mode of read, write, append Effectively read data from file and write data on file using C++ code 	<ul style="list-style-type: none"> Teacher give an example to learners where a file is opened in write mode, some data received from keyboard is written to it and file is closed. In another example, same file is opened in Read mode; data is accessed and shown on screen. 		
Week 10 26-30/6/2023		<ul style="list-style-type: none"> Reading data or object from a file Evaluation 				

			<ul style="list-style-type: none"> • Appreciate the concept of file, as C++ using standard input cin and standard output cout also as file stream 			
Key Unit Competency: To be able to Open, close, create a data file in C++ and read, write and append data to Files						
Week 11 3-7/7/2023	REVISION					
Week12 10-14-7/2023	Examination period					
Week 13 17-21/7/2023	Preparing school reports					