Department of BCA

Details of Lesson Plan

S.No.	Particulars	Details
1.	Course Name	Foundations of IT
2.	Course Code	UGSEC-1 04 (A)
3.	Academic Year	2024-25
4.	Semester	1ST
5.	Number of Lesson plans	42
6.	Faculty Assigned	Dr.Archana Sharma

Faculty Signature

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Lesson Plan No. 1	**Course Name:** Foundations of IT **Topic:** Basic Computer Architecture and Components	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. understand the fundamental components of a computer system. b. learn the functions of each component. c. differentiate between hardware and software.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- Introduce the concept of a computer as a tool for processing information.
	- Discuss the historical evolution of computers.
	- What are the essential parts of a computer that enable it to function?
	
	2. **Development:** (30 minutes)
	  a. Hardware Components:
	  Input Devices: Keyboard, mouse, scanner, webcam, microphone.
	  Output Devices: Monitor, printer, speakers, projector.
	b. **central Processing Unit (CPU):** Control center of the computer, responsible for executing instructions.
	  Motherboard: Connects all components of the computer.
	  Memory: Stores data and instructions temporarily (RAM) or permanently (ROM).
	  Storage Devices: Hard disk drive (HDD), solid-state drive (SSD), USB flash drive.
	c. **software Components:**
	  Operating System: Manages computer resources and provides a user interface (e.g., Windows, macOS, Linux).
	  Application Software: Programs designed for specific tasks (e.g., word processors, spreadsheets, games).
	
	1. Exercise (5 minutes) –
	What is the main function of the CPU?
	Name two input devices and two output devices.
	Differentiate between hardware and software.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	  URLs for Reference:
	  https://techterms.com/
	  https://en.wikipedia.org/wiki/Computer_architecture

	YouTube Video Reference:
	https://m.youtube.com/watch?v=BIpPTqHK-Lc
	Homework
	- Discuss the significance of input and output devices in a computer system, providing examples of each and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	2. Nearpod Quiz on Computer Architecture and Components.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 2	**Course Name:** Foundations of IT **Topic:** Central Processing Unit (CPU) and its functions	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the basic concept of a CPU.
	   b. Learn about the components of a CPU.
	   c. Understand the functions performed by a CPU.

Teaching Aids (if any)	a. Interactive Whiteboards b. Examples

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask question
	   - what they think a computer does.
	   - Explain that the brain of a computer is the Central Processing Unit (CPU).
	   - Relate the CPU to the human brain in terms of its role in controlling and processing information.
	2. **Development** (30 minutes)
	   a. **Components of a CPU:**
	     Control Unit: Directs the flow of data within the CPU.
	     Arithmetic Logic Unit (ALU): Performs mathematical calculations and logical operations.
	     Registers: Temporary storage locations for data.
	   b. **Functions of a CPU:**
	     Fetching: Retrieving instructions from memory.
	     Decoding: Interpreting the instructions.
	     Executing: Carrying out the instructions.
	     Storing: Saving the results of operations.
	   c. **Types of CPUs:**
	     Central Processing Unit (CPU)
	     Microprocessor
	     Microcontroller
	
	1. Exercise (5 minutes) –
	   - What are the three main components of a CPU?
	   - What is the function of the ALU?
	   - Name the process of retrieving instructions from memory.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	   URLs for Reference
	   https://study.com/learn/lesson/central-processing-unit-parts-function.html

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	https://www.techopedia.com/definition/2851/central-processing-unit-cpu **YouTube Video Reference** https://m.youtube.com/watch?v=7yKycb4e7Z0 Homework How have CPU architectures evolved over the past few decades? Provide examples of advancements in CPU technology and their impact on computing and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 3	**Course Name:** Foundations of IT **Topic:** Understanding the significance of number system in computing	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. understand the concept of different number systems used in computing.
	   b. learn how to convert between different number systems.
	   c. appreciate the significance of number systems in computer operations.

Teaching Aids (if any)	a. Interactive Whiteboards b. Examples

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask question
	  - if they have ever heard of binary code.
	  - Explain that binary code is a fundamental concept in computing and involves the use of 0s and 1s.
	  - Introduce the concept of number systems and their importance in computing.
	2. **Development** (30 minutes)
	  a. **Decimal Number System:**
	  Explain the decimal number system (base 10) and its familiarity in everyday life.
	  Demonstrate how to represent numbers using decimal digits.
	  b. **Binary Number System:**
	  Introduce the binary number system (base 2) and its use in computers.
	  Explain the concept of bits and bytes.
	  Demonstrate how to convert between decimal and binary numbers.
	  c. **Other Number Systems:**
	  Briefly discuss other number systems like hexadecimal (base 16) and octal (base 8).
	  Explain their uses in specific computing contexts.
	
	1. Exercise (5 minutes) –
	  - What is the base of the binary number system?
	  - Convert the decimal number 15 to binary.
	  - What is the significance of hexadecimal numbers in computing?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading

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	URLs for Reference:
	https://en.wikipedia.org/wiki/Binary_number
	https://en.wikipedia.org/wiki/Hexadecimal
	https://en.wikipedia.org/wiki/Octal
	YouTube Video Reference:
	https://m.youtube.com/watch?v=sXxwr66Y79Y
	Homework
	Identify and explain three real-world applications where different number systems are used and why they are significant and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 4	**Course Name:** Foundations of IT **Topic:** Non-Positional and Positional Number Systems	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the concept of number systems.
	   b. Differentiate between positional and non-positional number systems.
	   c. Explore examples of different number systems (e.g., Roman numerals, Mayan numerals, base-10).

Teaching Aids (if any)	a. Interactive Whiteboards b. Examples

Teaching Development	1. **Introduction** (5 minutes)
	Ask question
	- if they've ever encountered different ways of writing numbers.
	- Introduce the concept of number systems as different ways of representing numbers.
	- Discuss the importance of understanding number systems in various fields (e.g., computer science, mathematics).
	
	2. **Development** (30 minutes)
	   a. **Non-Positional Number Systems:**
	Explain that in non-positional systems, the value of a digit doesn't depend on its position.
	Examples:
	     i. Roman numerals (I, V, X, L, C, D, M)
	     ii. Egyptian hieroglyphics
	Discuss the limitations of non-positional systems for complex calculations.
	   b. **Positional Number Systems:**
	Explain that in positional systems, the value of a digit depends on its position and the base of the system.
	Examples:
	     i. Base-10 (decimal system)
	     ii. Base-2 (binary system)
	     iii. Base-16 (hexadecimal system)
	Discuss the advantages of positional systems for mathematical operations and computer representation.
	   c. **Conversion between Number Systems:**
	Demonstrate how to convert numbers between different bases (e.g., decimal to binary, binary to decimal).
	Use real-world examples to illustrate the concepts (e.g., IP addresses, color codes in computers).
	
	3. Exercise (5 minutes) –
	- What is the difference between a positional and a non-positional number system?

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	- Convert the decimal number 25 to binary. - What is the value of the Roman numeral "XXIV"? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://en.wikipedia.org/wiki/Numeral_system https://en.wikipedia.org/wiki/Binary_number https://en.wikipedia.org/wiki/Hexadecima Homework Identify and explain three real-world applications where different number systems are used and why they are significant and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 5	**Course Name:** Foundations of IT **Topic:** Overview of the functions and roles of operating systems	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic functions and roles of an operating system. b. Differentiate between different types of operating systems. c. Recognize the importance of operating systems in modern computing.
Teaching Aids (if any)	a. Interactive Whiteboards b. Examples

Teaching Development	1. **Introduction** (5 minutes)
	Ask question
	- if they have ever heard of an operating system.
	- Explain that an operating system is like the manager of a computer, controlling its resources and tasks.
	- Use everyday analogies to illustrate the concept of an operating system, such as a traffic controller or a restaurant manager.
	
	2. **Development** (30 minutes)
	  a. **Functions of an Operating System:**
	    Resource Management: Managing CPU, memory, storage, and I/O devices.
	    Process Management: Creating, scheduling, and terminating processes.
	    Memory Management: Allocating and deallocating memory to processes.
	    File Management: Organizing, storing, and retrieving files.
	    User Interface: Providing a way for users to interact with the computer.
	  b. **Types of Operating Systems:**
	    Single-user, Single-task: Designed for one user to perform one task at a time (e.g., MS-DOS).
	    Single-user, Multi-task: Designed for one user to perform multiple tasks simultaneously (e.g., Windows, macOS).
	    Multi-user, Multi-task: Designed for multiple users to perform multiple tasks simultaneously (e.g., Linux, Unix).
	  c. **Roles of an Operating System:**
	    Providing a platform for applications.
	    Ensuring efficient resource utilization.
	    Protecting system security.
	    Facilitating network communication.
	
	2. Exercise (5 minutes) –
	- What is the primary function of an operating system?
	- Name two types of operating systems.
	- Why is memory management important in an operating system?

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	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **Operating Systems Tutorial:** https://www.tutorialspoint.com/operating_system/index.htm **Types of Operating Systems:** https://www.tutorialspoint.com/basics_of_computers/basics_of_computers_types_of_os.htm **YouTube Video Reference:** **Introduction to Operating Systems:** https://www.youtube.com/playlist?list=PLBlnK6fEyqRiVhbXDGLXDk_OQAeuVcp2O Homework Discuss the role of an operating system in managing system memory. What techniques are used for memory allocation and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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| Lesson Plan No. 6 | Course Name: Foundations of IT | Course No.: |
| | Topic: Classification of operating systems | UGSEC-1 04 (A) |

Objectives	At the end of the lesson the student shall be able to: a. understand the different types of operating systems. b. learn the key characteristics of each operating system type. c. identify the appropriate operating system for specific tasks.
Teaching Aids (if any)	a. Interactive Whiteboards b. Examples and diagrams

Teaching Development	1. **Introduction** (5 minutes)
	Ask question
	- what they know about operating systems.
	- Briefly explain the role of an operating system in managing computer resources.
	- Introduce the concept of classifying operating systems based on their characteristics.
	
	2. **Development** (30 minutes)
	  a. Types of Operating Systems:
	  Real-time Operating Systems (RTOS):
	  Designed for applications requiring immediate response to events.
	  Used in industrial control systems, medical equipment, and robotics.
	  b. Multi-user Operating Systems:
	  Allow multiple users to access the system simultaneously.
	  Used in servers, mainframes, and time-sharing systems.
	  c. Single-user Operating Systems:
	  Designed for use by a single user at a time.
	  Commonly used on personal computers and workstations.
	  d. Operating System Characteristics:
	  Batch Processing:
	  Executes jobs in a predetermined sequence.
	  Used for large-scale data processing tasks.
	  e. Interactive Processing:
	  Provides immediate response to user input.
	  Used in desktop environments and web applications.
	  f. Multitasking:
	  Allows multiple tasks to run concurrently.
	  Used in most modern operating systems.
	  g. Multiprocessing:
	  Supports multiple processors or cores.
	  Used in high-performance computing and servers.
	
	2. Exercise (5 minutes) –
	- What is the main difference between a real-time operating system and a multi-user operating system?

	- Name two characteristics of a single-user operating system. - What is the purpose of multitasking in an operating system? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.tutorialspoint.com/operating_system/os_types.htm https://www.geeksforgeeks.org/operating-systems/ **YouTube Video Reference:** https://www.youtube.com/watch?v=s-tk8el8JoU Homework Discuss the advantages and disadvantages of using a real-time operating system in critical applications like medical devices or automotive systems and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 7	Course Name: Foundations of IT Topic: Overview of the Linux operating system and its history	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the basic concepts of the Linux operating system.
	   b. Learn about the history and development of Linux.
	   c. Explore the key features and benefits of Linux.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	    Briefly introduce the concept of an operating system and its role in a computer.
	    Discuss the popularity and growing importance of Linux in today's world.
	    Highlight the open-source nature of Linux and its community-driven development.
	
	2. **History of Linux:** (30 minutes)
	   -Explain the origins of Linux, tracing it back to Linus Torvalds and the Unix operating system.
	   -Discuss the early development and release of the Linux kernel.
	   - Mention key milestones and significant contributions to the Linux project.
	  Key Features and Benefits:
	    - Explore the core features of Linux, such as multitasking, - multi- user capabilities, and a command-line interface.
	    - Highlight the benefits of using Linux, including stability, security, and customization options.
	    - Discuss the open-source nature of Linux and its implications for users and developers.
	  Distributions of Linux:
	    -Introduce the concept of Linux distributions and their role in packaging and distributing the operating system.
	    -Discuss popular distributions like Ubuntu, Debian, Fedora, and CentOS.
	    -Explain the differences and target audiences for various distributions.
	
	3. Exercise (5 minutes) –
	    Who is the creator of the Linux kernel?
	    What is the significance of the open-source nature of Linux?
	    Name two popular Linux distributions.
	Use Nearpod to collect responses and discuss the answers.

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Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	 2. Suggested Reading
	  Linux Foundation: https://training.linuxfoundation.org/
	  Kernel.org: https://www.kernel.org/
	
	  DistroWatch: http://distrowatch.org/search.php?ostype=All&category=Beginners
	 A Brief History of Linux:
	 https://m.youtube.com/watch?v=s7u7jBwIocU
	 Homework
	 - Prepare ppt on comparison between windows and Linux operating system and submit on Google classroom.
	
	 Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Linux operating system Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 8	Course Name: Foundations of IT Topic: Linux File System Hierarchy and Directory Structure	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	    a. Understand the fundamental structure of the Linux file system.
	    b. Learn the purpose and significance of key directories.
	    c. Gain knowledge of common file system operations and commands.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	     Briefly explain the concept of a file system.
	     Discuss the importance of understanding file system structure for Linux users.
	     Introduce the concept of the root directory and its role.
	2. **Key Directories and Their Functions:** (30 minutes)
	    /: Root directory, the base of the file system hierarchy.
	    /bin: Contains essential system binaries.
	    /boot: Stores files related to the boot process.
	    /etc: Configuration files for the system.
	    /home: Stores user home directories.
	    /lib: Contains system libraries.
	    /mnt: Mount point for temporary file systems.
	    /opt: Optional software packages.
	    /tmp: Temporary files.
	    /usr: Contains user programs, libraries, and documentation.
	    /var: Stores variable data, such as logs and temporary files.
	Navigating the File System:
	    Using the cd command to change directories.
	    Listing directory contents with ls.
	    Creating and deleting directories using mkdir and rmdir.
	    Understanding relative and absolute paths.
	File System Operations:
	    Creating, copying, moving, and deleting files using commands like touch, cp, mv, and rm.
	    Changing file permissions with chmod.
	    Viewing file information using ls -l.
	
	3. Exercise (5 minutes) –
	    What is the purpose of the /etc directory?
	    How do you change to the root directory from any other directory?
	    Explain the difference between relative and absolute paths.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation

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	from students on these.
	2. Suggested Reading
	Linux Documentation Project: https://docs.kernel.org/
	Tutorials Point: https://www.tutorialspoint.com/unix/unix-file-system.htm
	Linux File System Hierarchy Explained:
	https://m.youtube.com/watch?v=HbgzrKJvDRw
	Homework
	- Draw diagram of Linux file and directory system and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	2. Nearpod Quiz on Linux file and directory system
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 9	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Basic Linux commands: navigation, file operations, and text manipulation	

Objectives	At the end of the lesson the student shall be able to:
	a. familiarize students with fundamental Linux commands for navigating directories, creating, modifying, and deleting files.
	b. introduce students to basic text manipulation using command-line tools.
	c. provide hands-on experience with Linux commands.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	Briefly explain the concept of the Linux operating system and its command-line interface.
	Highlight the importance of understanding basic Linux commands for system administration and scripting.
	Introduce the concept of the shell and its role in executing commands.
	2. **Navigation:** (30 minutes)
	ls: List directory contents
	cd: Change directory
	pwd: Print working directory
	File Operations:
	mkdir: Create a directory
	touch: Create a file
	rm: Remove a file or directory
	cp: Copy a file or directory
	mv: Move a file or directory
	Text Manipulation:
	cat: Concatenate and print files
	head: Print the first few lines of a file
	tail: Print the last few lines of a file
	grep: Search for patterns within a file
	3. Exercise (5 minutes) –
	What command is used to list the contents of the current directory?
	How do you create a new directory named "documents"?
	What command can be used to print the first 10 lines of a file named "myfile.txt"?
	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading

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	https://www.geeksforgeeks.org/linux-commands/ https://linuxize.com/post/basic-linux-commands/ **A Linux basic commands:** https://m.youtube.com/watch?v=IVquJh3DXUA Homework - Prepare PPT on all basic Linux commands and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 10	Course Name: Foundations of IT Topic: Software and Its Importance in Computing	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Define software and its types. b. Explain the role of software in computer operations. c. Recognize the impact of software on various industries.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - what they think a computer is used for.
	  - Introduce the concept of software as the invisible part of a computer that makes it work.
	  - Explain that software is like the brain of a computer, controlling its actions.
	2. **Development:** (30 minutes)
	  a Types of Software:
	  - System software: Operating systems (e.g., Windows, macOS), utility programs.
	  - Application software: Productivity tools (e.g., Microsoft Office), entertainment (e.g., games), specialized software (e.g., medical, engineering).
	  b. Role of Software:
	  - User interface: How users interact with the computer.
	  - Data processing: Handling and manipulating information.
	  - Task automation: Performing repetitive tasks efficiently.
	  c. Impact of Software:
	  - Business: Improving productivity, streamlining operations.
	  - Education: Creating interactive learning tools, facilitating research.
	  - Entertainment: Providing games, movies, and music.
	  - Healthcare: Diagnosing diseases, managing patient records.
	
	1. Exercise (5 minutes) –
	  - What are the two main types of software?
	  - How does software help in automating tasks?
	  - Name one example of specialized software.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	  URLs for Reference:
	  https://en.wikipedia.org/wiki/Software

	https://www.techtarget.com/searchsoftwarequality/ **YouTube Video Reference:** https://m.youtube.com/watch?v=PBDlbSAddAI Homework - Choose a business sector (e.g., healthcare, finance, education) and analyze how software has transformed its operations. What are some specific software tools used in that sector and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on Importance of software in Computing Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 11	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Types of Software	

Objectives	At the end of the lesson the student shall be able to: a. understand the different categories of software. b. identify the purpose and examples of each software type. c. appreciate the role of software in our daily lives.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) - Ask questions. - to share examples of software they have used recently (e.g., games, word processors, web browsers). - Explain that software is a set of instructions that tells a computer what to do. 2. **Development:** (30 minutes) 　**a. System Software:** 　- Definition: Software that manages the computer's hardware and resources. 　- Examples: Operating systems (Windows, macOS, Linux), device drivers. 　**b. Application Software:** 　- Definition: Software designed to perform specific tasks for users. 　- Examples: Word processors (Microsoft Word, Google Docs), spreadsheets (Excel, Google Sheets), presentation software (PowerPoint, Google Slides), web browsers (Chrome, Firefox), media players. 　**c. Utility Software:** 　- Definition: Software that helps manage and maintain a computer. 　- Examples: Antivirus software, disk cleanup tools, compression software. 1. Exercise (5 minutes) – 　- What is the difference between system software and application software? 　- Name two examples of utility software. 　- What type of software is used to create presentations? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading 　**URLs for Reference:**

	https://techterms.com/ https://en.wikipedia.org/wiki/Software **YouTube Video Reference:** https://www.youtube.com/watch?v=BTB86HeZVwk Homework 3. Discuss the impact of mobile application software on modern society. Provide examples of popular mobile applications and their uses and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on types of software. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 12	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Introduction to algorithms and flowcharts for problem-solving	

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of algorithms and their role in problem-solving. b. Learn the basic components of an algorithm. c. Understand the concept of flowcharts and their use in representing algorithms visually. d. create simple flowcharts for given problems.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - Begin by asking students if they have ever followed a recipe to cook a dish. Explain that a recipe is essentially a set of instructions that need to be followed in a specific order to achieve a desired result.
	 - Introduce the term "algorithm" as a sequence of steps that need to be followed to solve a problem.
	
	 2. **Development:** (30 minutes)
	   a. **Algorithms:**
	   Define an algorithm as a step-by-step procedure to solve a problem. Discuss the characteristics of a good algorithm:
	   - Clear and unambiguous
	   - Finite
	   - Effective
	   - Input and output
	   Provide examples of algorithms in everyday life (e.g., finding a book in a library, solving a math problem).
	   b. **Flowcharts:**
	   Explain that a flowchart is a visual representation of an algorithm using symbols.
	   Discuss the common symbols used in flowcharts (e.g., start/end, process, decision, input/output).
	   Demonstrate how to create a simple flowchart for a given problem (e.g., finding the largest number among three).
	   c. **Creating Flowcharts:**
	   Guide students through the process of creating flowcharts for simple problems.
	   Encourage students to work in pairs or small groups to practice creating flowcharts.
	
	 1. Exercise (5 minutes) –
	   - What is an algorithm?
	   - Name the three basic components of an algorithm.

	- What is the purpose of a flowchart? Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	   URLs for Reference:
	   https://www.geeksforgeeks.org/difference-between-algorithm-and-flowchart/
	   https://www.tutorialspoint.com/programming_methodologies/
	   programming_methodologies_flowchart_elements.htm
	   YouTube Video Reference:
	   https://m.youtube.com/watch?v=MUkvVLGz89k
	   Homework
	- Identify a real-world problem and describe how you would approach solving it using an algorithm. Include a flowchart to illustrate your process and submit on Google classroom.
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. 2. Nearpod Quiz on algorithm and flowchart Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 13	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Characteristics of a Good Programming Language	

Objectives	At the end of the lesson the student shall be able to:
	  a. understand the fundamental qualities of a good programming language.
	  b. identify the key factors to consider when choosing a programming language for a specific task.
	  c. appreciate the importance of readability, maintainability, and efficiency in programming.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - if they have ever heard of different programming languages (e.g., Python, Java, C++).
	 - Explain that programming languages are tools used to communicate with computers and create software.
	 - Introduce the concept of a "good programming language" and its importance in software development.
	2. **Development:** (30 minutes)
	  a. **Readability:**
	  Discuss the importance of clear and concise syntax.
	  Explain how meaningful variable and function names enhance readability.
	  Highlight the role of indentation and formatting in making code easier to understand.
	  b. **Maintainability:**
	  Discuss the concept of code modularity and its benefits.
	  Explain the importance of comments for explaining code logic.
	  Emphasize the need for consistent coding conventions.
	  c. **Efficiency:**
	  Explain the concept of time and space complexity.
	  Discuss how different programming languages can vary in terms of performance.
	  Highlight the trade-offs between readability and efficiency
	
	1. Exercise (5 minutes) –
	 - What are the three key characteristics of a good programming language?
	 - Why is readability important in programming?
	 - How can code maintainability be improved?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation

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	from students on these.
	2. Suggested Reading
	   URLs for Reference:
	    Programming language:
	    https://en.wikipedia.org/wiki/Programming_language
	    Characteristics of a Good Programming Language:
	    https://www.geeksforgeeks.org/introduction-to-programming-languages/
	Homework
	
	  Define portability and explain why it is a crucial feature for modern programming languages and submit on Google classroom.
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 14	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Overview of programming languages and their classification	

Objectives	At the end of the lesson the student shall be able to: a. introduce students to the concept of programming languages. b. classify programming languages based on different criteria. c. provide a basic understanding of the syntax and semantics of different types of programming languages.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - the role of programming languages in today's world.
	 - Highlight the importance of understanding programming languages for various fields, such as software development, data science, and automation.
	 - Briefly explain the concept of a programming language as a set of instructions used to communicate with computers.
	 2. **Development:** (30 minutes)
	    a. **Types of Programming Languages:**
	    Low-level languages:
	    Assembly language: Explain its direct correspondence to machine code.
	    Machine code: Discuss its binary representation and execution by the CPU.
	    b. **High-level languages:**
	    Interpreted languages (e.g., Python, JavaScript): Explain their execution through interpreters.
	    Compiled languages (e.g., C, Java): Discuss their compilation into machine code for execution.
	    c. **Classification based on Paradigm:**
	    Procedural languages: Explain their focus on procedures and functions.
	    Object-oriented languages: Discuss their emphasis on objects and their interactions.
	    Functional languages: Explain their use of functions as the primary building blocks.
	    Logic programming languages: Discuss their declarative approach using logic rules.
	    d. **Syntax and Semantics:**
	    Briefly introduce the concepts of syntax (rules for language structure) and semantics (meaning of language constructs).
	    Provide simple examples to illustrate the differences between syntax and semantics.

	1. Exercise (5 minutes) – - What is the difference between a low-level and a high-level programming language? - Name two examples of object-oriented programming languages. - What is the primary focus of functional programming languages? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** **W3Schools: https://www.w3schools.com/** **GeeksforGeeks: https://www.geeksforgeeks.org/** **TutorialsPoint: https://www.tutorialspoint.com/** **YouTube Video Reference:** **Introduction to Programming Languages:** **https://www.youtube.com/watch?v=zOjov-2OZ0E** Homework Choose a programming language and analyze its design philosophy, strengths, and weaknesses. How is it classified in terms of programming paradigms? and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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| Lesson Plan No. 15 | Course Name: Foundations of IT | Course No.: UGSEC-1 04 (A) |
| | Topic: Basic Concepts of Object-Oriented Programming | |

Objectives	At the end of the lesson the student shall be able to:
	a. Understand the fundamental principles of Object-Oriented Programming (OOP).
	b. Recognize the key concepts of objects, classes, encapsulation, inheritance, and polymorphism.
	c. Apply OOP principles to solve real-world programming problems.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- explain the concept of programming paradigms.
	- Introduce OOP as a popular paradigm that models real-world entities as objects.
	- Highlight the advantages of using OOP, such as code reusability, modularity, and maintainability.
	2. **Development:** (30 minutes)
	a. Objects and Classes:
	Define objects as instances of classes.
	Explain the relationship between objects and classes.
	Discuss the attributes (data members) and methods (functions) that define a class.
	b. Encapsulation:
	Describe encapsulation as the bundling of data and methods within a class.
	Explain the concept of access modifiers (public, private, protected) to control data access.
	Discuss the benefits of encapsulation for data security and code organization.
	c. Inheritance:
	Define inheritance as the ability of a class to inherit properties and methods from another class.
	Explain the concepts of parent (base) class and child (derived) class.
	Discuss the types of inheritance (single, multiple, hierarchical, hybrid).
	1. Exercise (5 minutes) –
	- What are the four fundamental principles of OOP?
	- Explain the concept of encapsulation with an example.
	- How does inheritance promote code reusability?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	 2. Suggested Reading
	     URLs for Reference:
	   https://www.w3schools.com/java/java_oop.asp
	 https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/
	 YouTube Video Reference:
	 https://www.youtube.com/watch?v=SiBw7os-_zI
	 Homework
	   Reflect on how OOP has changed the way software is developed. What are its advantages and disadvantages compared to procedural programming and submit on Google classroom.
	
	 Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 16	**Course Name:** Foundations of IT **Topic:** concepts of object-oriented programming class, object	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	    a. Understand the basic concepts of Object-Oriented Programming (OOP).
	    b. Define a class and its attributes.
	    c. Create objects from a class.
	    d. Differentiate between a class and an object.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the principles of OOP and its advantages over procedural programming.
	  - Introduce the concept of a class as a blueprint for creating objects.
	2. **Development:** (30 minutes)
	  a. **Class:**
	    Define a class as a template for creating objects.
	    Discuss the components of a class: attributes (data members) and methods (functions).
	    Provide examples of real-world objects and their corresponding classes.
	  b. **Object:**
	    Explain an object as an instance of a class.
	    Discuss how objects have their own values for attributes.
	    Demonstrate how to create objects using the new keyword.
	  c. **Relationship between Class and Object:**
	    Clarify the relationship between a class and its objects.
	    Illustrate how multiple objects can be created from the same class.
	    Discuss the concept of encapsulation and how it relates to classes and objects.
	
	1. Exercise (5 minutes) –
	  - What is a class in OOP?
	  - How do you create an object from a class?
	  - What is the difference between a class and an object?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	   URLs for Reference:
	  TutorialsPoint:
	  https://www.tutorialspoint.com/human_computer_interface/object_oriente

	d_programming.htm **W3Schools:** https://www.w3schools.com/java/java_oop.asp **YouTube Video Reference** **Programming with Mosh:** https://m.youtube.com/watch?v=j0lBrYSlYaU Homework Explain the relationship between classes and objects in the context of a simple project, such as a library management system. Identify at least three classes and their interactions and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluatio n	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 17	Course Name: Foundations of IT Topic: Inheritance in Object-Oriented Programming (OOP)	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of inheritance in OOP.
	  b. Differentiate between different types of inheritance (single, multiple, multilevel, hierarchical).
	  c. Apply inheritance to create reusable and modular code.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the concept of inheritance in real-life terms (e.g., child inheriting traits from parents).
	  - Introduce the idea of code reuse and modularity through inheritance.
	
	2. **Development:** (30 minutes)
	  a. Single Inheritance:
	  Define single inheritance.
	  Provide an example using a base class (e.g., Animal) and a derived class (e.g., Dog).
	  Explain how the derived class inherits properties and methods from the base class.
	
	  b. Multiple Inheritance:
	  Define multiple inheritance.
	  Provide an example using a class that inherits from multiple base classes (e.g., a class that inherits from both Vehicle and Electronic).
	  Discuss the diamond problem and potential conflicts in multiple inheritance.
	
	  c. Multilevel Inheritance:
	  Define multilevel inheritance.
	  Provide an example using a chain of derived classes (e.g., Grandparent -> Parent -> Child).
	  Explain how properties and methods are inherited through multiple levels.
	
	1. Exercise (5 minutes) –
	  - What is inheritance in OOP?
	  - Explain the difference between single and multiple inheritance.
	  - Can a class inherit from itself? Why or why not?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.

	2. Suggested Reading
	   URLs for Reference:
	   https://www.geeksforgeeks.org/object-oriented-programming-in-cpp/
	   https://www.tutorialspoint.com/java/java_inheritance.htm
	   YouTube Video Reference
	   https://m.youtube.com/watch?v=zbVAU7lK25Q
	   Homework
	   Describe a real-world scenario where inheritance is a suitable design choice. Outline the classes involved and their relationships and submit on Google classroom.
	
	   Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 18	Course Name: Foundations of IT Topic: constructors in Object-Oriented Programming (OOP)	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the concept of constructors in Object-Oriented Programming (OOP).
	   b. define and use constructors in different programming languages.
	   c. Recognize the importance of constructors in object initialization.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the concept of objects and classes in OOP.
	  - Introduce the idea of initializing objects with data.
	  - Highlight the role of constructors in this process.
	2. **Development:** (30 minutes)
	  a. **What is a constructor?**
	   A special member function that is automatically called when an object is created.
	   Used to initialize the data members of an object.
	   Has the same name as the class.
	  b. **Types of constructors:**
	   Default constructor: No parameters, provides default values.
	   Parameterized constructor: Takes parameters to initialize data members.
	   Copy constructor: Creates a new object as a copy of an existing object.
	  c. **Constructor overloading:**
	   Defining multiple constructors with different parameters.
	   Enables flexible object creation based on different initialization requirements.
	
	1. Exercise (5 minutes) –
	  - What is the primary purpose of a constructor in OOP?
	  - How does a parameterized constructor differ from a default constructor?
	  - Can a class have multiple constructors? If so, how is this achieved?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	  URLs for Reference:
	  GeeksforGeeks: https://www.geeksforgeeks.org/constructors-c/

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	Tutorials Point:
	https://www.tutorialspoint.com/java/java_constructors.htm
	W3Schools: https://www.w3schools.com/cs/cs_constructors.php
	YouTube Video Reference:
	Java Constructors: https://www.youtube.com/watch?v=pgBk8HC7jbU
	Homework
	Imagine you are designing a class for a banking system. What constructors would you include in a class Account, and what parameters would they take and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 19	Course Name: Foundations of IT Topic: Polymorphism in Object-Oriented Programming (OOP)	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the concept of polymorphism in object-oriented programming.
	   b. Differentiate between static and dynamic polymorphism.
	   c. Apply polymorphism to create more flexible and reusable code.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - Defining polymorphism as the ability of objects of different types to be treated as if they were of the same type.
	   - Provide a real-world analogy, such as different animals (dogs, cats, birds) all being able to move, but in different ways.
	
	2. **Development:** (30 minutes)
	   a. Static Polymorphism:
	   Explain static polymorphism using method overloading.
	   Demonstrate how multiple methods with the same name but different parameters can be defined within a class.
	   Show how the compiler determines which method to call based on the number and types of arguments passed.
	   b. Dynamic Polymorphism:
	   Introduce dynamic polymorphism using method overriding.
	   Explain how a subclass can provide a different implementation of a method inherited from its superclass.
	   Demonstrate how the runtime determines which method to call based on the actual object type.
	   c. Real-World Examples:
	   Provide examples of polymorphism in everyday programming scenarios, such as: Geometric shapes (circles, squares, rectangles) all having a method.calculateArea()
	   Different types of vehicles (cars, bikes, trucks) all implementing an method.accelerate()
	
	1. Exercise (5 minutes) –
	   - What is polymorphism in OOP?
	   - Explain the difference between static and dynamic polymorphism.
	   - Provide an example of method overriding in Java.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.

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	2. Suggested Reading **URLs for Reference:** **Oracle Java Tutorials:** https://docs.oracle.com/en/database/oracle/oracle-database/23/jjdev/Java-overview.html **GeeksforGeeks:** https://www.geeksforgeeks.org/polymorphism-in-java/ **YouTube Video Reference:** **Polymorphism in Java:** https://m.youtube.com/watch?v=jhDUxynEQRI Homework Research and present an example of a well-known software library or framework that uses polymorphism effectively. Explain how it benefits the overall design and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 20	Course Name: Foundations of IT Topic: Data Encapsulation in OOP	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of data encapsulation in OOP. b. Explain the role of access modifiers in controlling data access. c. Apply data encapsulation to create secure and maintainable code.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes) 　- Ask questions. 　- Introduce data encapsulation as the practice of bundling data and the methods that operate on it within a single unit (class). 　- Explain how encapsulation helps protect data from unauthorized access and modification. 2. **Development:** (30 minutes) 　**a. Access Modifiers:** 　　Discuss the four access modifiers in Java: , 　　and .publicprivateprotecteddefault 　　Explain how each modifier affects the visibility of class members (fields and methods). 　　Demonstrate how to use access modifiers to control data access within a class and between classes. 　**b. Getters and Setters:** 　　Introduce getters and setters as methods used to access and modify private data members. 　　Explain why using getters and setters is important for encapsulation. 　　Provide examples of how to implement getters and setters in a class. 　**c. Encapsulation Benefits:** 　　Discuss the benefits of data encapsulation, such as: 　　Data hiding: Protecting data from unauthorized access. 　　Code modularity: Making code more organized and reusable. 　　Data integrity: Ensuring data consistency and validity. 1. Exercise (5 minutes) – 　- What is data encapsulation in OOP? 　- Name the four access modifiers in Java and explain their differences. 　- Why is it important to use getters and setters for private data members? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.

	2. Suggested Reading
	   URLs for Reference:
	Oracle Java Tutorials:
	https://docs.oracle.com/en/database/oracle/oracle-database/23/jjdev
	/Java-overview.html
	YouTube Video Reference:
	Data Encapsulation in Java:
	https://m.youtube.com/watch?v=jhDUxynEQRI
	Homework
	   Provide a real-world analogy to explain data encapsulation. How does this analogy help in understanding the concept and submit on Google classroom.
	
	Spend 5 minutes to wrap up and consolidate the learnings

Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 21	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Exception Handling in OOP	

Objectives	At the end of the lesson the student shall be able to:
	a. Understand the concept of exceptions in OOP.
	b. Learn how to handle exceptions using , and blocks try catch finally
	c. Implement custom exceptions for specific error conditions.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- Define exceptions as unexpected events that disrupt the normal flow of a program.
	- Explain the importance of exception handling to prevent program crashes and provide informative error messages.
	2. **Development:** (30 minutes)
	a. Basic Exception Handling:
	Demonstrate how to use a block to enclose code that might throw exceptions try
	Show how to use a block to handle specific exceptions catch
	Explain the block for code that must be executed regardless of whether an exception is thrown finally
	b. Common Built-in Exceptions:
	Introduce common built-in exceptions like and .ArithmeticException NullPointerException ArrayIndexOutOfBoundsException IOException
	Provide examples of when these exceptions might occur.
	c. Custom Exceptions:
	Explain how to create custom exceptions by extending the class.Exception
	Demonstrate how to throw custom exceptions to indicate specific error conditions.
	1. Exercise (5 minutes) –
	- What is an exception in OOP?
	- How do you handle exceptions in Java using and blocks try catch finally
	- Create a custom exception to represent an invalid input.
	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	URLs for Reference:
	Oracle Java Tutorials:

| | https://docs.oracle.com/en/java/javase/17/docs/api/java.base/java/lang/Exception.html

Homework
Reflect on the importance of exception handling in your implementation. How does it improve the robustness and maintainability of your code and submit on Google classroom.

Spend 5 minutes to wrap up and consolidate the learnings |
|---|---|
| **Evaluation** | 1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.

Spend 5 minutes to evaluate student assimilation of the lesson contents |

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Lesson Plan No. 22	Course Name: Foundations of IT Topic: Database Management Systems (DBMS) - Characteristics and History	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the fundamental concepts of a DBMS.
	   b. Learn about the key characteristics of a DBMS.
	   c. Explore the historical evolution of DBMS.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Define a DBMS as a software system used to manage and organize data efficiently.
	  - Discuss the importance of DBMS in today's data-driven world.
	2. **Development:** (30 minutes)
	  a. Characteristics of a DBMS:
	   Data Independence: Explain how DBMS provides logical and physical data independence.
	   Data Integrity: Discuss the mechanisms used by DBMS to ensure data accuracy and consistency.
	   Data Security: Explain how DBMS protects data from unauthorized access and modification.
	  b. Historical Evolution of DBMS:
	   Hierarchical DBMS: Discuss the structure and limitations of hierarchical DBMS.
	   Network DBMS: Explore the network model and its relationship to hierarchical DBMS.
	   Relational DBMS: Explain the relational model, its concepts (tables, rows, columns, keys), and advantages over previous models.
	
	1. Exercise (5 minutes) –
	  - What is a DBMS?
	  - Name three key characteristics of a DBMS.
	  - What is the difference between hierarchical and relational DBMS?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	  DBMS Tutorial: https://www.w3schools.in/dbms/intro
	  Database Systems Concepts:
	  https://www.w3schools.com/sql/sql_ref_database.asp
	  YouTube Video Reference:

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	Introduction to DBMS: https://www.youtube.com/watch?v=6Iu45VZGQDk Homework What is the significance of the hierarchical and network database models? How did they influence the development of later database systems and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 23	Course Name: Foundations of IT Topic: Database Management System (DBMS) Applications	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Understand the various applications of DBMS in different domains. b. Recognize the benefits of using DBMS for data management. c. Identify suitable DBMS for specific application requirements.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- Define a DBMS as a software system used to manage large collections of data.
	- Explain how DBMS helps in organizing, storing, and retrieving data efficiently.
	- Highlight the importance of DBMS in today's data-driven world.
	2. **Development:** (30 minutes)
	  a. **Business Applications:**
	  Discuss how DBMS is used in various business functions like:
	  Customer relationship management (CRM)
	  Inventory management
	  Financial accounting
	  Human resource management (HRM)
	  b. **Scientific and Research Applications:**
	  Explain the role of DBMS in scientific research, including:
	  Biological databases (GenBank, PDB)
	  Geographical information systems (GIS)
	  Climate data management
	  c. **Web Applications:**
	  Discuss the use of DBMS in web development:
	  E-commerce websites
	  Content management systems (CMS)
	  Social media platforms
	  Online banking
	
	1. Exercise (5 minutes) –
	- What is a DBMS?
	- Name three business applications of DBMS.
	- How is DBMS used in scientific research?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.

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	2. Suggested Reading
	W3Schools: <https://www.w3schools.com/sql/sql_ref_database.asp>
	Tutorials Point: <https://www.tutorialspoint.com/dbms/index.htm>
	YouTube Video Reference:
	DBMS Applications: https://www.youtube.com/watch?v=dQw4w9WgXcQ
	Homework
	Design a simple relational database schema for a library management system. What tables would you include and what relationships would exist between them and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 24	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Components of DBMS	

Objectives	At the end of the lesson the student shall be able to: a. understand the fundamental components of a Database Management System (DBMS). b. differentiate between data, information, and database. c. learn about the role of database schemas and data models.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - the importance of data in today's world.
	  - Highlight the challenges of managing large volumes of data without a proper system.
	  - Introduce the concept of a DBMS as a tool to efficiently store, retrieve, and manage data.
	2. **Development:** (30 minutes)
	  a. **Data, Information, and Database:**
	    Define data as raw facts and figures.
	    Explain how data is processed to create meaningful information.
	    Introduce a database as a collection of interrelated data.
	  b. **Database Schema and Data Model:**
	    Define a database schema as the logical structure of a database.
	    Explain the role of a data model in representing the structure and relationships between data elements.
	    Discuss common data models like relational, hierarchical, and network models.
	  c. **DBMS Components:**
	    Identify the key components of a DBMS:
	    Data Dictionary
	    Query Processor
	    Storage Manager
	    Transaction Manager
	    Recovery Manager
	    Briefly explain the functions of each component.
	
	1. Exercise (5 minutes) –
	  - What is the difference between data and information?
	  - Name three common data models used in DBMS.
	  - What is the role of a query processor in a DBMS?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation

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	from students on these.
	2. Suggested Reading
	DBMS Tutorial: https://www.tutorialspoint.com/dbms/index.htm
	Database Schema: https://www.ibm.com/topics/database-schema
	Data Model: https://en.wikipedia.org/wiki/Data_model
	YouTube Video Reference:
	DBMS Components Explained: https://www.youtube.com/watch?v=l30LPgMEkdw
	Homework
	Discuss recent trends or advancements in DBMS technologies (e.g., cloud databases, NoSQL databases). How do these trends affect the traditional components of DBMS and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 25	**Course Name:** Foundations of IT **Topic:** Advantages and Disadvantages of DBMS	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of a Database Management System (DBMS). b. Identify the key advantages of using a DBMS. c. Recognize the potential disadvantages of DBMS implementation. d. Analyze the trade-offs between advantages and disadvantages.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - the role of data in modern organizations.
	 - Explain the challenges of managing data manually.
	 - Introduce the concept of a DBMS as a solution to these challenges.
	
	 2. **Development:** (30 minutes)
	    a. **Advantages of DBMS:**
	      Data Integrity and Consistency:
	      Discuss the importance of data integrity and consistency.
	      Explain how DBMS ensures data accuracy and prevents inconsistencies.
	      Data Security and Control:
	      Discuss the security risks associated with data.
	      Explain how DBMS provides mechanisms to protect data from unauthorized access.
	      Data Sharing and Collaboration:
	      Explain how DBMS facilitates data sharing among multiple users.
	      Discuss the benefits of collaboration enabled by DBMS.
	    b. **Disadvantages of DBMS:**
	      Cost and Complexity:
	      Discuss the initial investment required to implement a DBMS.
	      Explain the complexity involved in designing, implementing, and maintaining a DBMS.
	      Performance Issues:
	      Discuss potential performance bottlenecks in DBMS systems.
	      Explain strategies to optimize DBMS performance.
	      Vendor Dependence:
	      Discuss the risks associated with relying on a specific DBMS vendor.
	      Explain the importance of vendor lock-in and potential alternatives.
	
	 1. Exercise (5 minutes) –

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	- What is the primary purpose of a DBMS? - Name three advantages of using a DBMS. - What are some potential disadvantages of DBMS implementation? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **Oracle Database:** https://www.oracle.com/database/ **Microsoft SQL Server:** https://www.microsoft.com/en-us/sql-server/sql-server-downloads **MySQL:** https://www.mysql.com/ **YouTube Video Reference:** **Advantages and Disadvantages of DBMS:** https://www.youtube.com/watch?v=YcYF-kxE0Sw Homework Compare and contrast the advantages and disadvantages of DBMS with flat file systems. In what scenarios would a DBMS be preferred and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 26	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Data Modeling, Records and Files, Abstraction and Data Integration	

Objectives	At the end of the lesson the student shall be able to:
	a. Understand the concept of data modeling and its importance.
	b. Learn about records and files as fundamental data structures.
	c. Explore the concept of abstraction and its role in data management.
	d. Grasp the significance of data integration in modern systems.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - if they have ever encountered large datasets or information systems.
	  - Explain how data modeling provides a structured approach to represent and manage information effectively.
	  - Introduce the concepts of records and files as basic building blocks of data storage.
	
	2. **Development:** (30 minutes)
	  a. Data Modeling:
	  Define data modeling as the process of creating a conceptual representation of data.
	  Discuss different data modeling techniques (e.g., Entity-Relationship (ER) modeling, Unified Modeling Language (UML)).
	  Explain the importance of data modeling in database design and software development.
	  b. Records and Files:
	  Define records as collections of related data items (fields).
	  Discuss different types of records (e.g., fixed-length, variable-length).
	  Explain the concept of files as organized collections of records.
	  c. Abstraction:
	  Define abstraction as the process of hiding unnecessary details and focusing on essential characteristics.
	  Discuss the role of abstraction in data management (e.g., data encapsulation, information hiding).
	  Explain how abstraction simplifies the development and maintenance of complex systems.
	  d. Data Integration:
	  Define data integration as the process of combining data from multiple sources into a unified view.
	  Discuss the challenges and benefits of data integration.
	  Explain the importance of data integration in decision-making and analytics.

	1. Exercise (5 minutes) – - What is the purpose of data modeling? - How do records and files differ in terms of data organization? - Explain the concept of abstraction in the context of data management. Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** **Data Modeling:** https://en.wikipedia.org/wiki/Data_modeling **Records and Files:** https://en.wikipedia.org/wiki/File_system **Abstraction:** https://en.wikipedia.org/wiki/Abstraction_%28computer_science%29 **Data Integration:** https://en.wikipedia.org/wiki/Data_integration **YouTube Video Reference:** **Data Modeling Tutorial:** https://www.youtube.com/watch?v=cm8UBAXwjxY **Records and Files Explained:** https://www.youtube.com/watch?v=_U9zSiOJwzE **Abstraction in Programming:** https://m.youtube.com/watch?v=_OVWjMkGsNY Homework Create an ER diagram for a library system that includes books, authors, and borrowers and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 27	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Language and Architecture in DBMS	

Objectives	At the end of the lesson the student shall be able to: a. Understand the different types of languages used in DBMS. b. Learn about the components of a DBMS architecture. c. Explore the relationship between language and architecture in DBMS.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the concept of a Database Management System (DBMS).
	  - Discuss the importance of language and architecture in DBMS for efficient data management.
	2. **Development:** (30 minutes)
	  a. **Data Definition Language (DDL):**
	    Explain the purpose of DDL.
	    Discuss common DDL statements (CREATE, ALTER, DROP).
	    Provide examples of DDL statements**.**
	  b. **Data Manipulation Language (DML):**
	    Explain the purpose of DML.
	    Discuss common DML statements (SELECT, INSERT, UPDATE, DELETE).
	    Provide examples of DML statements.
	  c. **Data Control Language (DCL):**
	    Explain the purpose of DCL.
	    Discuss common DCL statements (GRANT, REVOKE).
	    Provide examples of DCL statements.
	  d. **DBMS Architecture:**
	    Explain the components of a typical DBMS architecture (DBMS engine, data dictionary, transaction manager, query processor).
	    Discuss the role of each component in DBMS operations.
	    Illustrate the relationship between language and architecture in DBMS.
	
	1. Exercise (5 minutes) –
	  - What is the main purpose of Data Definition Language (DDL)?
	  - Name three common DML statements used in DBMS.
	  - What are the key components of a DBMS architecture?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	  URLs for Reference:
	  https://en.wikipedia.org/wiki/Category:Database_management_systems

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	https://www.w3schools.com/sql/ https://www.geeksforgeeks.org/dbms-architecture-2-level-3-level/ Homework Describe the three main components of a Database Management System architecture (i.e., the internal, conceptual, and external levels).Explain how each level corresponds to the languages used in DBMS (such as SQL for querying, DDL for schema definition, etc.) and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 28	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Views in DBMS	

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of views in DBMS. b. Learn how to create, modify, and drop views. c. Explore the advantages and disadvantages of using views.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Introduce the concept of views as virtual tables derived from existing tables.
	  - Explain how views provide a simplified and controlled perspective of data.
	2. **Development:** (30 minutes)
	  a. Creating views:
	  Demonstrate how to create a view using a SQL query.
	  Discuss the syntax and components of a view creation statement.
	  Explain the concept of base tables and their relationship to views.
	  b. Modifying views:
	  Show how to alter a view's definition using the ALTER VIEW statement.
	  Discuss the limitations and considerations for modifying views.
	  c. Dropping views:
	  Explain how to remove a view using the DROP VIEW statement.
	  Discuss the implications of dropping a view on dependent objects.
	
	1. Exercise (5 minutes) –
	  - What is a view in DBMS?
	  - How can you create a view based on multiple tables?
	  - What are the advantages of using views?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.w3schools.com/sql/sql_ref_create_view.asp https://docs.oracle.com/en/database/oracle/oracle-database/19/sqlrf/ **YouTube Video Reference:**

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	https://m.youtube.com/watch?v=rtpK2xQp1Q8 Homework Discuss whether views can be updated and under what conditions. Provide an example of a situation where updating a view is not possible and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings	
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents	

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Lesson Plan No. 29	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Data Models Classification	

Objectives	At the end of the lesson the student shall be able to: a. understand the concept of data models in database systems. b. classify data models based on their structure and characteristics. c. learn about the key features and applications of different data models.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the role of data models in representing and organizing data in databases.
	  - Discuss the importance of understanding data models for database design and development.
	2. **Development:** (30 minutes)
	  a. Hierarchical Data Model:
	  Explain the tree-like structure of hierarchical data models.
	  Discuss the concept of parent-child relationships.
	  Mention the limitations and applications of hierarchical data models.
	  b. Network Data Model:
	  Introduce the concept of a graph-based structure in network data models.
	  Explain the use of pointers to represent relationships between data items.
	  Discuss the advantages and disadvantages of network data models.
	  c. Relational Data Model:
	  Explain the concept of tables, rows, and columns in relational data models.
	  Discuss the use of primary keys and foreign keys to establish relationships.
	  Mention the advantages of relational data models, such as data independence and flexibility.
	
	1. Exercise (5 minutes) –
	  - What is the basic structure of a hierarchical data model?
	  - How do network data models differ from hierarchical data models?
	  - What is the primary advantage of relational data models over hierarchical and network models?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation

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	from students on these.
	2. Suggested Reading
	URLs for Reference: https://www.geeksforgeeks.org/data-models-in-dbms/ https://www.tutorialspoint.com/dbms/dbms_data_models.htm Homework Classify the following data models in DBMS into their respective categories. For each model, provide a brief description and one example of its use case and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 30	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Introduction to SQL	

Objectives	At the end of the lesson the student shall be able to:
	a. Understand the basic concepts of SQL.
	b. Learn how to create, retrieve, update, and delete data from a database.
	c. Grasp the fundamental SQL syntax and structure.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz
Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- Explain the role of databases in storing and managing information.
	- Introduce SQL as a language used to interact with databases.
	- Briefly discuss the history and evolution of SQL.
	2. **Development:** (30 minutes)
	a. Database Concepts:
	Define a database and its components (tables, rows, columns). Explain the concept of a relational database.
	b. SQL Syntax:
	Introduce basic SQL syntax and structure. Discuss the use of keywords and clauses (SELECT, FROM, WHERE, etc.).
	c. SQL Operations:
	Demonstrate how to create, read, update, and delete data using SQL statements. Provide examples of SELECT, INSERT, UPDATE, and DELETE queries.
	1. Exercise (5 minutes) –
	- What is SQL used for?
	- Name the four basic SQL operations.
	- Write a simple SQL query to select all records from a table named "students".
	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	URLs for Reference:
	W3Schools SQL Tutorial: https://www.w3schools.com/sql/
	Oracle SQL Reference:
	https://docs.oracle.com/database/121/SQLRF/toc.htm
	YouTube Video Reference:
	SQL Tutorial for Beginners: https://m.youtube.com/watch?

	v=h0nxCDiD-zg Homework Explain the purpose of indexing in SQL and how it can improve query performance and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 31	**Course Name:** Foundations of IT **Topic:** Networks: Characteristics, Scope, and Typical Uses of Each Network Type	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	  a. Understand the concept of networks and their different types.
	  b. Identify the key characteristics of each network type.
	  c. Recognize the scope and typical uses of various networks.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - to share their understanding of the term "network" and provide examples from their daily lives.
	  - Explain the importance of networks in our interconnected world and how they facilitate communication, information sharing, and resource access.
	
	2. **Development:** (30 minutes)
	  a. **Network Types:**
	    Local Area Network (LAN):
	    Definition and characteristics (e.g., limited geographical area, high data transfer rates).
	    Examples (e.g., office networks, school networks, home networks).
	  b. **Wide Area Network (WAN):**
	    Definition and characteristics (e.g., covers a large geographical area, lower data transfer rates).
	    Examples (e.g., the internet, corporate networks connecting multiple locations).
	  c. **Metropolitan Area Network (MAN):**
	    Definition and characteristics (e.g., covers a city or metropolitan area, intermediate data transfer rates).
	    Examples (e.g., city-wide networks for government agencies, educational institutions).
	  d. **Network Topologies:**
	    Briefly explain common network topologies (e.g., star, bus, ring).
	    Discuss their advantages and disadvantages.
	  e. **Network Protocols:**
	    Introduce the concept of network protocols and their role in ensuring communication.
	    Mention examples of common protocols (e.g., TCP/IP, HTTP).
	
	1. Exercise (5 minutes) –
	  - What is the difference between a LAN and a WAN?
	  - Name three common network topologies.

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	- What is the role of network protocols in communication? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** **Computer Networking Tutorial:** https://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm **Network Topologies Explained:** https://techterms.com/definition/network_topology **Network Protocols: A Beginner's Guide:** https://www.techtarget.com/searchnetworking/info/getstarted **YouTube Video Reference:** **Understanding Networks: A Visual Guide:** https://www.youtube.com/watch?v=4_zSIXb7tLQ Homework Summarize the importance of understanding different network types and their specific applications in modern technology and business environments and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 32	**Course Name:** Foundations of IT **Topic:** Introduction to Network Topologies, Advantages and Disadvantages of Different Topologies	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. understand the concept of network topologies.
	   b. identify and describe different types of network topologies.
	   c. compare and contrast the advantages and disadvantages of various topologies.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - if they have ever used a network (e.g., home Wi-Fi, school network).
	   - Explain the concept of a network as a collection of interconnected devices.
	   - Introduce the idea of network topology as the arrangement of these devices.
	
	2. **Development:** (30 minutes)
	   a. **Types of Network Topologies:**
	     Bus Topology:
	     Describe the structure (single cable connecting all devices).
	     Discuss advantages (simple, inexpensive) and disadvantages (centralized failure point, limited scalability).
	   b. **Star Topology:**
	     Describe the structure (central hub connecting all devices).
	     Discuss advantages (centralized management, easy troubleshooting) and disadvantages (high cost, dependency on central hub).
	   c. **Ring Topology:**
	     Describe the structure (devices connected in a circular fashion).
	     Discuss advantages (high reliability, equal transmission) and disadvantages (complex installation, difficult troubleshooting).
	   d. **Advantages and Disadvantages of Topologies:**
	     Compare and contrast the advantages and disadvantages of each topology based on factors such as cost, reliability, scalability, and ease of management.
	     Encourage students to think about real-world scenarios where different topologies might be used.
	
	1. Exercise (5 minutes) –
	   - What are the three main types of network topologies?
	   - Describe the advantages and disadvantages of a star topology.

	- In which topology are all devices connected to a central hub? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://techterms.com/definition/network_topology https://www.geeksforgeeks.org/network-topology/ Homework A small office is planning to set up a new network. They expect to have 10 computers and a printer. Based on the definitions and characteristics of the topologies you've studied, recommend one topology for their setup and explain why you chose it over the others and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 33	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Explanation of the TCP/IP protocol suite and its layers	

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of networking protocols. b. Learn about the TCP/IP protocol suite and its significance. c. Identify and explain the different layers of the TCP/IP model. d. Understand the functions of each layer in the TCP/IP model.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- Briefly introduce the concept of computer networks and their importance.
	- Discuss the need for communication protocols to facilitate data exchange between devices.
	- Highlight the dominance of the TCP/IP protocol suite in modern networking.
	2. **Development:** (30 minutes)
	  a. **TCP/IP Protocol Suite:**
	  Define the TCP/IP protocol suite and its role in network communication.
	  Explain the hierarchical structure of the TCP/IP model.
	  b. **Layers of the TCP/IP Model:**
	  Application Layer:
	  Describe the functions of the application layer.
	  Discuss common application protocols (HTTP, FTP, SMTP, etc.).
	  c. **Transport Layer:**
	  Explain the role of the transport layer in ensuring reliable data delivery.
	  Discuss TCP and UDP protocols and their differences.
	  d. **Internet Layer:**
	  Describe the functions of the internet layer in routing data packets.
	  Discuss IP addressing and routing protocols (IP, ICMP).
	  e. **Network Access Layer:**
	  Explain the role of the network access layer in physical transmission.
	  Discuss Ethernet and Wi-Fi technologies.
	
	1. Exercise (5 minutes) –
	- What is the significance of the TCP/IP protocol suite in networking?

	- Name the four layers of the TCP/IP model and briefly explain their functions. - What is the difference between TCP and UDP protocols? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://en.wikipedia.org/wiki/Internet_protocol_suite https://en.wikipedia.org/wiki/Internet_protocol_suite https://www.geeksforgeeks.org/differences-between-tcp-and-udp/ **YouTube Video Reference** https://m.youtube.com/watch?v=wvPe4Zb0tUA Homework What security protocols exist at the application layer of TCP/IP, and how do they enhance the security of data transmission and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 34	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: OSI Model and Its Layers	

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of the Open Systems Interconnection (OSI) model. b. Identify the seven layers of the OSI model and their functions. c. Recognize the importance of the OSI model in network communication.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	- Ask questions.
	- if they have ever used the internet.
	- Explain that the internet is a vast network of interconnected computers that communicate with each other using a set of rules and protocols.
	- Introduce the OSI model as a conceptual framework that divides network communication into seven layers.
	
	2. **Development:** (30 minutes)
	  a. **Layer 1: Physical Layer:**
	  Discuss the physical components of a network, such as cables, connectors, and network interface cards (NICs).
	  Explain how data is transmitted as electrical signals over physical media.
	  b. **Layer 2: Data Link Layer:**
	  Describe the functions of the data link layer, including framing, error detection, and flow control.
	  Discuss the concept of MAC addresses and their role in identifying devices on a network.
	  c. **Layer 3: Network Layer:**
	  Explain the role of the network layer in routing data packets across networks.
	  Discuss the concept of IP addresses and their use in addressing devices on the internet.
	  d. **Layer 4: Transport Layer:**
	  Describe the functions of the transport layer, including reliability, flow control, and multiplexing.
	  Discuss the two main protocols used at this layer: TCP and UDP.
	  e. **Layer 5: Session Layer:**
	  Explain the role of the session layer in establishing, managing, and terminating communication sessions.
	  Discuss the concept of half-duplex and full-duplex communication.

	f. Layer 6: Presentation Layer: Describe the functions of the presentation layer, including data encoding, encryption, and compression. Discuss the role of presentation layer protocols in ensuring data compatibility between different systems. **g. Layer 7: Application Layer:** Explain the role of the application layer in providing services to end users. Discuss examples of application layer protocols, such as HTTP, FTP, and SMTP. 1. Exercise (5 minutes) – - What is the purpose of the OSI model? - Name the seven layers of the OSI model in order from bottom to top. - What is the difference between TCP and UDP? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://en.wikipedia.org/wiki/OSI_model https://en.wikipedia.org/wiki/OSI_model **YouTube Video Reference:** https://m.youtube.com/watch?v=LANW3m7UgWs Homework Choose a common networking protocol (e.g., HTTP, FTP, or DNS) and explain how it fits within the OSI Model, detailing which layer it operates at and its role and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 35	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Internet of Things (IoT)	

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of the Internet of Things (IoT). b. Identify various applications of IoT in different industries. c. Recognize the potential benefits and challenges associated with IoT.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - if they have ever heard of "smart devices" or "connected devices."
	 - Explain that these devices are part of a growing trend known as the Internet of Things (IoT).
	 - Introduce IoT as a technology that connects everyday objects to the internet, enabling them to collect and exchange data.
	
	 2. **Development:** (30 minutes)
	    a. **What is IoT?**
	      Define IoT as a network of physical objects embedded with sensors, software, and network connectivity.
	      Explain how IoT devices can collect data, process information, and interact with other devices.
	    b. **Applications of IoT**
	      Discuss various applications of IoT in different industries, such as:
	      Smart homes (e.g., smart thermostats, smart appliances)
	      Healthcare (e.g., wearable devices, remote patient monitoring)
	      Agriculture (e.g., smart farming, precision agriculture)
	      Transportation (e.g., connected cars, smart traffic management)
	      Manufacturing (e.g., smart factories, predictive maintenance)
	    c. **Benefits and Challenges of IoT**
	      Discuss the potential benefits of IoT, including:
	      Increased efficiency and productivity
	      Improved decision-making
	      Enhanced customer experience
	      Cost savings
	    d. **Discuss the challenges associated with IoT, such as:**
	      Security and privacy concerns
	      Interoperability issues
	      Technical complexities
	
	 1. Exercise (5 minutes) –
	 - What is the Internet of Things (IoT)?

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	- Name three applications of IoT in different industries. - What are some of the challenges associated with IoT? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.iotforall.com/ **YouTube Video Reference:** https://www.youtube.com/watch?v=dQw4w9WgXcQ Homework Research a specific IoT implementation (e.g., smart city project, agricultural IoT). Describe its objectives, technologies used, and outcomes and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 35	**Course Name:** Foundations of IT **Topic:** Internet of Things (IoT)	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of the Internet of Things (IoT). b. Identify various applications of IoT in different industries. c. Recognize the potential benefits and challenges associated with IoT.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - if they have ever heard of "smart devices" or "connected devices."
	 - Explain that these devices are part of a growing trend known as the Internet of Things (IoT).
	 - Introduce IoT as a technology that connects everyday objects to the internet, enabling them to collect and exchange data.
	
	 2. **Development:** (30 minutes)
	    a. **What is IoT?**
	      Define IoT as a network of physical objects embedded with sensors, software, and network connectivity.
	      Explain how IoT devices can collect data, process information, and interact with other devices.
	    b. **Applications of IoT**
	      Discuss various applications of IoT in different industries, such as:
	      Smart homes (e.g., smart thermostats, smart appliances)
	      Healthcare (e.g., wearable devices, remote patient monitoring)
	      Agriculture (e.g., smart farming, precision agriculture)
	      Transportation (e.g., connected cars, smart traffic management)
	      Manufacturing (e.g., smart factories, predictive maintenance)
	    c. **Benefits and Challenges of IoT**
	      Discuss the potential benefits of IoT, including:
	      Increased efficiency and productivity
	      Improved decision-making
	      Enhanced customer experience
	      Cost savings
	    d. **Discuss the challenges associated with IoT, such as:**
	      Security and privacy concerns
	      Interoperability issues
	      Technical complexities
	
	 1. Exercise (5 minutes) –
	 - What is the Internet of Things (IoT)?

	- Name three applications of IoT in different industries. - What are some of the challenges associated with IoT? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.iotforall.com/ **YouTube Video Reference:** https://www.youtube.com/watch?v=dQw4w9WgXcQ Homework Research a specific IoT implementation (e.g., smart city project, agricultural IoT). Describe its objectives, technologies used, and outcomes and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

Lesson Plan No. 37	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Big Data Analytics	

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of big data and its characteristics. b. Identify the challenges and opportunities associated with big data. c. Explore the applications of big data analytics in various industries.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - if they have heard about big data.
	   - Explain that big data refers to the massive amount of data that is generated every day from various sources, such as social media, IoT devices, and business transactions.
	   - Discuss the challenges of storing, processing, and analyzing such large datasets.
	2. **Development:** (30 minutes)
	   a. **Characteristics of Big Data:**
	   Volume: The sheer amount of data generated.
	   Velocity: The speed at which data is generated and processed.
	   Variety: The different types of data, including structured, unstructured, and semi-structured data.
	   Veracity: The accuracy and quality of the data.
	   b. **Challenges of Big Data:**
	   Storage: Storing large datasets efficiently.
	   Processing: Analyzing large datasets in a timely manner.
	   Integration: Combining data from different sources.
	   Security: Protecting sensitive data.
	   c. **Applications of Big Data Analytics:**
	   Healthcare: Improving patient outcomes and reducing costs.
	   Finance: Detecting fraud and optimizing investment strategies.
	   Marketing: Personalizing customer experiences and improving targeting.
	   Retail: Optimizing inventory management and supply chain operations.
	
	1. Exercise (5 minutes) –
	   - What are the four V's of big data?
	   - What are some of the challenges associated with big data?
	   - Name one industry that has benefited from big data analytics.
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.

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	2. Suggested Reading **URLs for Reference:** https://www.sas.com/en_us/insights/big-data/what-is-big-data.html https://www.ibm.com/cloud/learn/what-is-big-data Homework Provide three real-world applications of Big Data Analytics in different industries and discuss their impact and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 38	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Cloud Computing	

Objectives	At the end of the lesson the student shall be able to: a. Understand the basic concept of cloud computing. b. Identify the different types of cloud deployment models. c. Recognize the benefits and challenges of cloud computing.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - if they have ever used online services like Google Drive or Dropbox.
	   - Explain that these services are examples of cloud computing, where data and applications are stored and accessed over the internet.
	   - Introduce the concept of cloud computing as a model for delivering IT services.
	
	2. **Development:** (30 minutes)
	   a. Types of Cloud Deployment Models:
	   Public Cloud: Discuss the characteristics of public cloud environments, such as shared resources and pay-as-you-go pricing.
	   Private Cloud: Explain the concept of private clouds, where resources are dedicated to a single organization.
	   Hybrid Cloud: Describe hybrid clouds, which combine elements of public and private clouds.
	   b. Benefits of Cloud Computing:
	   Scalability: Discuss how cloud computing allows for flexible scaling of resources to meet changing demands.
	   Cost-effectiveness: Explain how cloud computing can help reduce IT costs through pay-as-you-go pricing and shared resources.
	   Accessibility: Discuss the benefits of accessing applications and data from anywhere with an internet connection.
	   c. Challenges of Cloud Computing:
	   Security: Address the security concerns associated with storing data in the cloud, such as data breaches and unauthorized access.
	   Vendor Lock-in: Discuss the risks of becoming dependent on a specific cloud provider.
	   Performance: Explain potential performance issues that may arise due to network latency or resource contention.
	
	1. Exercise (5 minutes) –

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	- What are the three main types of cloud deployment models? - What are the benefits of using a public cloud? - What are some security concerns associated with cloud computing? Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://aws.amazon.com/what-is-cloud-computing/ https://www.ibm.com/cloud/what-is-cloud-computing **YouTube Video Reference:** https://www.youtube.com/watch?v=dQw4w9WgXcQ Homework How does cloud computing impact data privacy? What measures can organizations take to protect user data in the cloud and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 39	Course Name: Foundations of IT Topic: Artificial Intelligence, Virtual, and Augmented Reality	Course No.: UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the basic concepts of Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR).
	   b. Recognize the applications and potential of these technologies in various fields.
	   c. Evaluate the ethical implications and challenges associated with AI, VR, and AR.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - if they have ever heard of AI, VR, or AR.
	   - Provide brief definitions and examples of each technology.
	   - Explain the increasing prevalence and impact of these technologies in our daily lives.
	
	2. **Development:** (30 minutes)
	   a. Artificial Intelligence (AI):
	   Discuss the definition and different types of AI (e.g., narrow AI, general AI, superintelligence).
	   Explore real-world applications of AI, such as machine learning, natural language processing, and robotics.
	   Discuss the ethical implications of AI, including bias, job displacement, and autonomous weapons.
	   b. Virtual Reality (VR):
	   Explain the concept of VR and how it creates immersive experiences.
	   Discuss the hardware and software components of VR systems.
	   Explore applications of VR, such as gaming, training, and therapy.
	   c. Augmented Reality (AR):
	   Explain the concept of AR and how it overlays digital information onto the real world.
	   Discuss the hardware and software components of AR systems.
	   Explore applications of AR, such as education, retail, and entertainment.
	
	1. Exercise (5 minutes) –
	   - What is the difference between AI, VR, and AR?
	   - Name one ethical concern associated with the development of AI.
	   - What are some potential applications of VR in education?

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	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.oculus.com/ https://www.microsoft.com/en-us/hololens/ **YouTube Video Reference:** https://www.youtube.com/watch?v=dQw4w9WgXcQ Homework Discuss how AI, VR, and AR can converge in industries like healthcare, entertainment, and gaming. What synergies might arise and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 40	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: IT Governance, Operational risk and governance,	

Objectives	At the end of the lesson the student shall be able to: a. Understand the concept of IT governance and its importance in organizations. b. Identify key operational risks in IT environments. c. Explore governance frameworks and best practices for managing IT risks.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	   - Ask questions.
	   - the increasing reliance on technology in businesses.
	   - Emphasize the need for effective IT governance to ensure that technology aligns with organizational goals and mitigates risks.
	2. **Development:** (30 minutes)
	   a. IT Governance:
	   Define IT governance as the framework that ensures that IT supports the organization's strategic objectives.
	   Discuss the key principles of IT governance, such as alignment, accountability, and risk management.
	   Explore common governance frameworks, such as COBIT and ITIL.
	
	   b. Operational Risk:
	   Define operational risk as the potential for loss arising from inadequate or failed internal processes, people, and systems.
	   Identify common operational risks in IT environments, such as data breaches, system failures, and fraud.
	   Discuss the impact of operational risks on an organization's reputation, financial performance, and compliance.
	
	   c. Governance and Risk Management:
	   Explain how effective governance can help mitigate operational risks.
	   Discuss best practices for identifying, assessing, and managing IT risks.
	   Explore the role of internal controls, risk assessments, and incident response plans in IT governance.
	
	1. Exercise (5 minutes) –
	   - What is the primary goal of IT governance?
	   - Name three common operational risks in IT environments.
	   - How can effective governance help mitigate operational risks?
	Use Nearpod to collect responses and discuss the answers.

Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	URLs for Reference:
	https://www.isaca.org/
	https://www.gartner.com/
	YouTube Video Reference:
	https://www.youtube.com/watch?v=dQw4w9WgXcQ
	Homework
	How has the rise of cloud computing and artificial intelligence affected IT governance and operational risk? Discuss potential risks and benefits and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
	Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 41	Course Name: Foundations of IT	Course No.: UGSEC-1 04 (A)
	Topic: Governance of Internal IT Processes and E-Governance Framework	

Objectives	At the end of the lesson the student shall be able to: a. Understand the importance of IT governance in organizations. b. Identify key components of an effective IT governance framework. c. Learn about the principles and practices of e-governance.
Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	 - Ask questions.
	 - the role of technology in today's world and how it impacts organizations.
	 - Explain that effective IT governance is essential for ensuring that an organization's IT investments align with its strategic objectives.
	 - Introduce the concept of e-governance as the use of information and communication technology to improve governance processes.
	
	 2. **Development:** (30 minutes)
	   a. IT Governance Framework:
	   Discuss the COBIT framework and its five principles: governance, value delivery, risk management, resource management, and performance measurement.
	   Explain the role of IT governance committees and their responsibilities.
	   Discuss the importance of aligning IT strategy with business strategy.
	   b. E-Governance Principles:
	   Explain the principles of e-governance, such as transparency, accountability, participation, and inclusivity.
	   Discuss the benefits of e-governance, including improved efficiency, reduced corruption, and enhanced citizen engagement.
	   c. E-Governance Applications:
	   Discuss various e-governance applications, such as online citizen services, e-procurement, and e-health.
	   Analyze the challenges and opportunities associated with implementing e-governance initiatives.
	
	 1. Exercise (5 minutes) –
	 - What is the purpose of IT governance?
	 - Name the five principles of the COBIT framework.
	 - What are the benefits of e-governance?

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	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these. 2. Suggested Reading **URLs for Reference:** https://www.isaca.org/resources/cobit **YouTube Video Reference:** https://www.youtube.com/watch?v=dQw4w9WgXcQ Homework What future trends do you see influencing the development of e-governance frameworks? How might emerging technologies like AI and blockchain impact e-governance and submit on Google classroom. Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss. Spend 5 minutes to evaluate student assimilation of the lesson contents

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Lesson Plan No. 42	**Course Name:** Foundations of IT **Topic:** Governance of Internal IT Processes and E-Governance Framework	**Course No.:** UGSEC-1 04 (A)

Objectives	At the end of the lesson the student shall be able to:
	   a. Understand the importance of IT governance in organizations.
	   b. Learn about the key components of an effective IT governance framework.
	   c. Explore the concept of e-governance and its benefits.
	   d. Understand the challenges and best practices in implementing e-governance.

Teaching Aids (if any)	a. Use of Nearpod tool for online quiz

Teaching Development	1. **Introduction** (5 minutes)
	  - Ask questions.
	  - Briefly explain the concept of governance and its relevance in today's technology-driven world.
	  - Highlight the importance of effective IT governance in ensuring organizational success and compliance.
	  - Introduce the concept of e-governance and its potential to transform public services.
	
	2. **Development:** (30 minutes)
	  a. IT Governance Framework:
	  Discuss the key components of an IT governance framework, including strategy, organization, people, processes, technology, and information.
	  Explain the role of the board of directors and management in IT governance.
	  Discuss the importance of aligning IT with business objectives.
	  b. E-Governance:
	  Define e-governance and its key characteristics.
	  Explore the benefits of e-governance, such as improved efficiency, transparency, and accessibility.
	  Discuss the challenges in implementing e-governance, including technological infrastructure, security, and digital literacy.
	  c. Best Practices in IT Governance and E-Governance:
	  Share best practices for implementing effective IT governance frameworks.
	  Discuss case studies of successful e-governance initiatives.
	  Emphasize the importance of continuous evaluation and improvement in IT governance and e-governance.
	
	1. Exercise (5 minutes) –
	  - What are the key components of an IT governance framework?

	- What are the benefits of e-governance?
	- What are some challenges in implementing e-governance?
	Use Nearpod to collect responses and discuss the answers.
Closure	1. Summarize the Lesson Learning Outcomes and get affirmation from students on these.
	2. Suggested Reading
	URLs for Reference:
	https://www.isaca.org/resources/cobit
	YouTube Video Reference:
	https://www.youtube.com/watch?v=dQw4w9WgXcQ
	Homework
	What future trends do you see influencing the development of e-governance frameworks? How might emerging technologies like AI and blockchain impact e-governance and submit on Google classroom.
	Spend 5 minutes to wrap up and consolidate the learnings
Evaluation	1. Reflective Questions (What, Why, Who?). Allow students to answer and discuss.
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