BUDHA DAL PUBLIC SCHOOL, PATIALA

LESSON PLAN OF CLASS VIII (SUBJECT: COMPUTER)

Term –I & Term-II Syllabus (Session 2025-26)

April

Chapter-1 Computer Network

May

Lesson – 2 Lists and Tables in HTML 5

July

Lesson – 3 Links and Forms in HTML

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First Term Examination

October

Lesson – 6 Looping in Python

November

Lesson – 7 E-Commerce and Computer Ethics

December

Lesson -8 Artificial Intelligence –Robotics

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Term – 1

Lesson – 1 Computer Network
Lesson – 2 Lists and Tables in HTML 5
Lesson – 3 Links and Forms in HTML
Lesson – 4 Tables in Access

Term - 2

Lesson – 6 Looping in Python
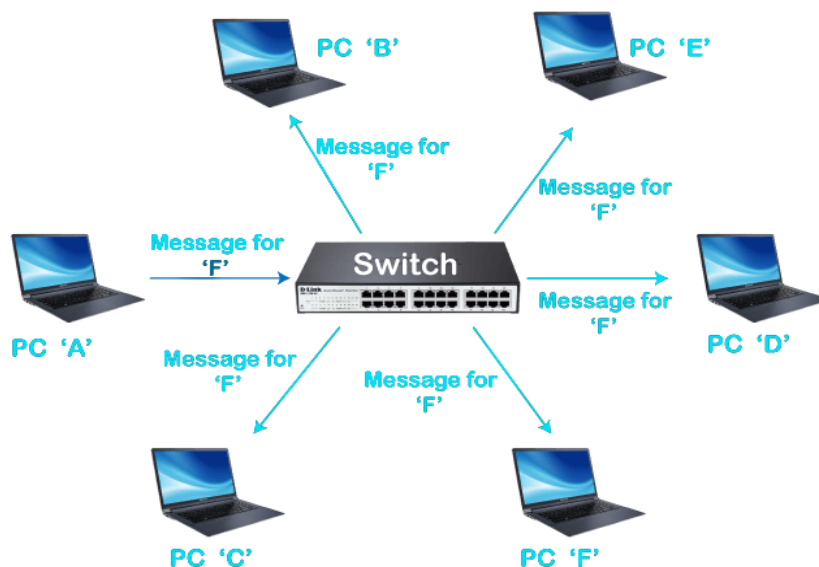**Lesson – 7** E-Commerce and Computer Ethics
Lesson -8 Artificial Intelligence –Robotics
Lesson – 9 Data Science

TERM-I SYLLABUS

Month-April

Chapter-1 Computer Networks

Topics to be Covered:

1. What is a Network?
2. Components of a Network
3. Types of Network
4. Network Security

Learning Objectives: By the end of this lesson, students will be able to:

- Understand the concept of a computer network and its basic functions.
- Identify and describe the essential components that make up a network.
- Differentiate between the various types of networks (LAN, WAN, MAN).
- Understand the importance of network security and identify common security threats.
- Apply the concepts learned to real-life networking situations.

Teaching Aids/Materials Required:

- Computers with internet access
- Projector or interactive whiteboard
- Network diagrams for visual explanation
- Sample documents for practice
- Handouts detailing network components and types

Teaching Methodology:

1. **Introduction:**
   - Start by asking students if they've ever used the internet or connected devices in their homes or schools. Discuss how these devices are interconnected, leading into the concept of computer networks.

o   Explain why networks are essential in today's world (e.g., communication, resource sharing, and the internet).

2. **Explanation:**
   o   **What is a Network?**
       ▪   Define a network as a collection of computers and devices connected to share resources, data, and communicate.
       ▪   Discuss different types of networks: Local Area Network (LAN), Wide Area Network (WAN), and Metropolitan Area Network (MAN).
   o   **Components of a Network:**
       ▪   Introduce essential components such as computers, routers, switches, hubs, cables, and wireless access points.
       ▪   Explain their roles in enabling communication between devices.
   o   **Types of Network:**
       ▪   Discuss different types of networks in more detail: LAN, WAN, MAN, and Personal Area Network (PAN).
       ▪   Show real-life examples of each network type (e.g., home network for LAN, the internet for WAN).
   o   **Network Security:**
       ▪   Explain the importance of network security to prevent unauthorized access and data breaches.
       ▪   Discuss common security threats like viruses, malware, phishing, and hacking.
       ▪   Introduce methods of securing networks, such as firewalls, encryption, and secure passwords.

3. **Activity:**
   o   **What is a Network?**
       ▪   Have students draw and label a simple network diagram (e.g., a home network with a router, laptop, and smartphone).
   o   **Components of a Network:**
       ▪   Provide a list of network components and have students identify which items belong to a network.
       ▪   In groups, have students match network devices with their functions (e.g., router, switch, modem).
   o   **Types of Network:**
       ▪   Ask students to categorize different networks based on examples they've seen in their daily lives (e.g., their school's intranet is a LAN, the internet is a WAN).
   o   **Network Security:**
       ▪   Present a scenario involving a network security breach and ask students to identify potential vulnerabilities and suggest solutions (e.g., using strong passwords, firewalls).

4. **Discussion & Recap:**
   o   Review the key points of the lesson, asking students to recall the types of networks and their components.
   o   Discuss why network security is critical and how it applies to their personal and academic lives.
   o   Encourage students to share any personal experiences with network security threats and how they handled them.

Art & Integrated Activity/Project/Practical:

- **Network Design Project:**
    - o In groups, students will design a small network for a hypothetical company, detailing the components they would use (e.g., routers, switches, and firewalls).
    - o Present the designed network, explaining the types of devices and their roles.
- **Network Security Case Study:**
    - o Students will research a real-world network security breach (e.g., data leaks or hacking incidents) and present their findings. They will also discuss security measures that could have prevented the attack.

Expected Learning Outcomes: After the lesson, students will:

- Understand the basic concept of computer networks and their importance.
- Be able to identify the components of a network and understand their functions.
- Be able to classify different types of networks and explain their uses.
- Understand the importance of securing a network and be able to recognize common security risks.
- Apply knowledge of network security to protect networks from potential threats.

Assignments & Assessments:

- **Homework:** Research and write a brief report on the differences between LAN, WAN, and MAN, providing real-life examples for each.
- **Classwork:** Complete a worksheet on network components, where students will match devices to their respective functions and draw a simple network diagram.
- **Quiz:** A short multiple-choice and practical quiz covering the definitions of networks, components, types of networks, and network security threats.
- **Project:** Create a presentation that explains how to secure a network in a school or home setting, providing solutions for potential security risks.

Remedial Measures:

- Provide additional one-on-one explanations and visual aids for students struggling with the concepts of network components or types.
- Offer simplified handouts that explain basic networking terms and concepts with visual examples.
- Use peer tutoring by pairing students who grasp the concepts well with those who may need more guidance.
- Plan a follow-up session that focuses on hands-on practice, such as designing a small network or configuring basic security settings.

Lists and Tables in HTML5

Topics to be Covered:

1. Using Lists in HTML
2. Unordered and Ordered Lists
3. CSS List Properties
4. Description Lists
5. Tables in HTML

Learning Objectives: By the end of this lesson, students will be able to:

- Create and manage unordered, ordered, and description lists in HTML.
- Apply CSS properties to style HTML lists effectively.
- Construct and format tables in HTML to organize data.
- Understand the semantic use of different list types and tables for structuring web content.

Teaching Aids/Materials Required:

- Computers with internet access and a code editor (e.g., Visual Studio Code, Sublime Text).
- Projector or interactive whiteboard for demonstrations.
- Sample HTML documents showcasing various list and table structures.
- Handouts detailing HTML tags for lists and tables, along with CSS styling examples.
- Visual aids illustrating the structure and styling of lists and tables.

Teaching Methodology:

1. **Introduction:**
   o Discuss the importance of organizing content on web pages using lists and tables.
   o Engage students by asking how they would present a list of their favorite books or a schedule of weekly classes on a webpage.
2. **Explanation:**
   o **Using Lists in HTML:**
     ▪ Introduce the three main types of lists in HTML:
       ▪ **Unordered Lists (`<ul>`):** Used for items without a specific order.
       ▪ **Ordered Lists (`<ol>`):** Used for items that follow a sequence.

- **Description Lists (`<dl>`):** Used for terms and their descriptions.
- **Unordered and Ordered Lists:**
  - Demonstrate how to create both unordered and ordered lists, explaining the use of `<li>` tags for list items.
  - Show how to nest lists within each other to create hierarchical structures.
- **CSS List Properties:**
  - Explain how to style lists using CSS, including:
    - Changing bullet styles in unordered lists.
    - Adjusting numbering styles in ordered lists.
    - Modifying list item spacing, alignment, and font properties.
- **Description Lists:**
  - Show how to create description lists using `<dl>`, `<dt>`, and `<dd>` tags.
  - Discuss appropriate use cases for description lists.
- **Tables in HTML:**
  - Introduce the structure of HTML tables using `<table>`, `<tr>`, `<th>`, and `<td>` tags.
  - Explain how to add headers, merge cells using `colspan` and `rowspan`, and apply basic table styling.
  - Highlight the importance of semantic HTML and accessibility considerations when using tables.

3. **Activity:**
   - **Lists Creation:**
     - Have students create a webpage that includes both unordered and ordered lists, such as a list of hobbies or a set of instructions.
   - **CSS Styling:**
     - Ask students to style their lists by customizing bullet points, numbering styles, and item appearances using CSS.
   - **Description Lists:**
     - Students will create a description list for a glossary of terms related to their favorite subject.
   - **Table Construction:**
     - Guide students to build a table displaying a weekly schedule or a comparison chart, incorporating headers and appropriate data.
     - Encourage the use of `colspan` and `rowspan` to enhance table layouts.

4. **Discussion & Recap:**
   - Review the key concepts covered in the lesson, emphasizing the differences between list types and the structure of tables.
   - Encourage students to share their created lists and tables, discussing the challenges faced and solutions found.
   - Highlight the role of semantic HTML in creating accessible and well-structured web content.

Art & Integrated Activity/Project/Practical:

- **Webpage Project:** Assign students to design a personal webpage that features:
  - An unordered list of their favorite books, movies, or hobbies.
  - An ordered list of steps to accomplish a task they are familiar with.
  - A description list explaining key terms related to their field of interest.
  - A table summarizing a topic of their choice, such as a comparison of different technologies or a schedule of events.
  - Apply CSS to style all lists and tables, ensuring a cohesive and visually appealing design.

Expected Learning Outcomes: After the lesson, students will:

- Be proficient in creating and managing various types of lists and tables in HTML.
- Understand how to apply CSS styles to enhance the appearance and functionality of lists and tables.
- Appreciate the importance of using semantic HTML elements for organizing web content effectively.

Assignments & Assessments:

- **Homework:** Complete the webpage project as described in the Art & Integrated Activity section.
- **Classwork:** Participate in hands-on activities during the lesson, demonstrating the ability to create and style lists and tables.
- **Quiz:** A short quiz covering the syntax and usage of HTML tags for lists and tables, as well as CSS properties applicable to

Month-July

Chapter-3 Links and Forms in HTML

Topics to be Covered:

1. Linking
2. Linking Web Pages using Anchor `<A>` Tag
3. Linking within a Page (Creating Bookmarks)
4. Embedding Links
5. Embedding Audio and Video Files
6. Forms `<FORM>` Tag
7. Form Controls

Learning Objetives:

By the end of this lesson, students will be able to:

- Understand how to create links between web pages using the anchor `<a>` tag.
- Learn how to create bookmarks (internal links) to navigate within the same page.

- Embed audio and video files into a webpage.
- Utilize the `<form>` tag to create interactive forms.
- Understand and implement various form controls like text inputs, checkboxes, radio buttons, and submit buttons.

Teaching Aids/Materials Require:

- Computers with internet access and a code editor (e.g., Visual Studio Code, Sublime Text).
- Projector or interactive whiteboard for demonstrations.
- Sample HTML documents showcasing various forms and links.
- Handouts detailing HTML tags for links, embedding audio/video, and creating forms.
- Visual aids illustrating the structure and usage of links and forms.

Teaching Methodology:

1. Introduction:

- Discuss the importance of linking web pages for navigation and embedding multimedia content.
- Engage students by asking how they would link to different sections of a webpage or embed a video/audio player on their site.

2. Explanation:

Linking:

- Introduce the concept of hyperlinks and their role in connecting web pages and resources.
- Show the basic syntax for creating a link using the anchor `<a>` tag:

  html

  Copy

  ```
  <a href="URL">Link Text</a>
  ```

Linking Web Pages using Anchor `<A>` Tag:

- Demonstrate how to link one HTML page to another by specifying the `href` attribute with the destination URL.

  html

  Copy

  ```
  <a href="about.html">About Us</a>
  ```

- Discuss relative vs. absolute URLs and when to use each.

Linking within a Page (Creating Bookmarks):

- Explain how to create bookmarks (internal links) to navigate between different sections of the same webpage.
- Show the use of the `id` attribute to define a bookmark target and how to link to it:

  html

  Copy

  ```
  <a href="#section1">Go to Section 1</a>
  <div id="section1">Content of Section 1</div>
  ```

Embedding Links:

- Demonstrate how to embed links for external resources like email addresses, phone numbers, or other websites.

- o Example for email link:

  html

  Copy

  ```html
  <a href="mailto:someone@example.com">Send Email</a>
  ```

- o Example for phone number link:

  html

  Copy

  ```html
  <a href="tel:+1234567890">Call Us</a>
  ```

Embedding Audio and Video Files:

- Introduce the `<audio>` and `<video>` tags for embedding multimedia content.

- Show how to embed audio and video files with the `controls` attribute for play, pause, and volume control.

  - o Example for embedding an audio file:

    html

    Copy

    ```html
    <audio controls>
    <source src="audiofile.mp3" type="audio/mp3">
      Your browser does not support the audio element.
    </audio>
    ```

  - o Example for embedding a video file:

    html

    Copy

    ```html
    <video controls>
    <source src="video.mp4" type="video/mp4">
      Your browser does not support the video element.
    </video>
    ```

Forms `<FORM>` Tag:

- Explain the purpose of forms in HTML for gathering user input.

- Introduce the `<form>` tag, its structure, and attributes.

  html

  Copy

  ```html
  <form action="/submit" method="POST">
  <!-- form content here -->
  </form>
  ```

- Discuss the `action` attribute (where form data is sent) and the `method` attribute (GET or POST).

Form Controls:

- Explain different form control elements like:

  - o **Text inputs:**`<input type="text">`

  - o **Password inputs:**`<input type="password">`

  - o **Radio buttons:**`<input type="radio">`

  - o **Checkboxes:**`<input type="checkbox">`

  - o **Submit button:**`<input type="submit">`

- o **Textarea:**`<textarea></textarea>`
- o **Dropdown lists:**`<select><option></option></select>`
- Provide examples of using each form control in a basic form.

3. Activity:

Create Links:

- Have students create a webpage with links to external websites and another page within the same site.

Bookmarks:

- Students will create a long webpage with different sections (e.g., About, Services, Contact), and add internal links to navigate between them.

Embedding Multimedia:

- Students will embed an audio file and a video file into their webpage using the appropriate HTML tags.

Create a Form:

- Students will build a contact form with various form controls (text inputs, radio buttons, checkboxes, and a submit button).

4. Discussion & Recap:

- Review the key concepts covered in the lesson, emphasizing the importance of forms and links in creating interactive and user-friendly web pages.
- Encourage students to share their created links, forms, and embedded media.

Art & Integrated Activity/Project/Practical:

- **Webpage Project:** Assign students to create a personal webpage that includes:
  - o External and internal links (use anchor tags for navigation).
  - o Embedded audio and video files (such as an audio playlist and a video introduction).
  - o A functional contact form with at least one text input, one radio button, one checkbox, and a submit button.
  - o Apply appropriate styling to improve the layout and appearance of the page.

Expected Learning Outcomes:

After the lesson, students will:

- Be proficient in creating links to navigate between pages and within the same page.
- Understand how to embed multimedia content (audio and video) into webpages.
- Gain practical experience in building and styling forms with various input controls.

Assignments & Assessments:

Homework:

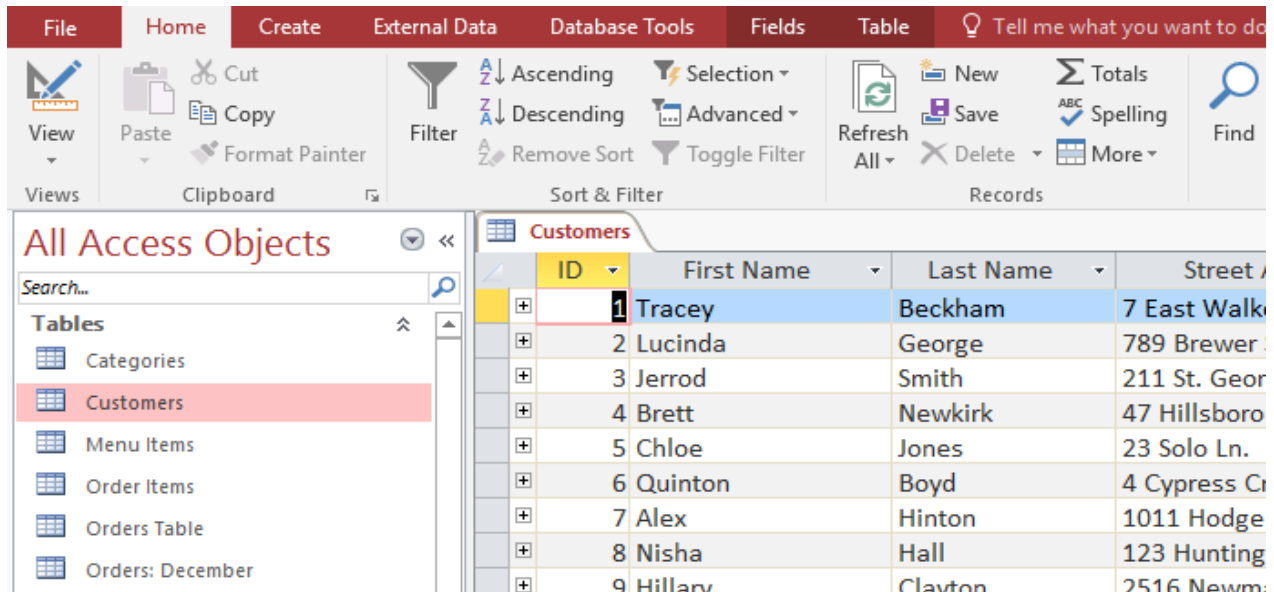- Complete the webpage project as described in the Art & Integrated Activity section.

Classwork:

- Participate in hands-on activities, creating links, embedding multimedia, and building forms.

Quiz:

- A short quiz covering the HTML syntax for links, embedding audio and video files, and using form controls.

Month-August

Chapter- Tables in Access

Learning Objectives:

By the end of this lesson, students will be able to:

1. Open an existing table in Microsoft Access.

2. Understand and identify various data types used in Access.

3. Modify a table in datasheet view.

4. Create a table using design view in Access.

5. Set and manage a primary key in a table.

6. Modify a table structure in design view to add, delete, or change fields.

Teaching Aids & Materials Required:

- Computers with Microsoft Access installed

- Projector and screen for demonstrations

- Handouts with step-by-step instructions on creating and modifying tables in Access

- Whiteboard and markers for explanations

- Sample database with existing tables for practical demonstration

Teaching Methodology:

1. **Introduction (10 minutes):**

   o Briefly introduce the topic, highlighting the importance of tables in Access for data storage.

   o Discuss the key concepts such as tables, fields, records, data types, and primary keys.

2. **Demonstration (15 minutes):**

   o Open Microsoft Access and demonstrate how to open an existing table.

o Explain the different data types (Text, Memo, Number, Date/Time, Currency, etc.), and show examples of when to use each data type.

o Walk through how to modify a table in datasheet view (e.g., adding and editing records).

o Show how to create a table in design view, set a primary key, and modify the structure of a table.

3. **Hands-on Activity (20 minutes):**

o Students will create a new table in design view, set a primary key, and populate it with sample data in datasheet view.

o Students will also practice modifying the table structure (e.g., adding/removing fields).

4. **Review & Recap (10 minutes):**

o Review the key points of the lesson: opening a table, modifying a table in datasheet and design view, and setting primary keys.

o Answer any questions students might have.

Art & Integrated Activity/Project/Practical:

- **Project:** Create a database for a library system, including a table for books. Students will:

  1. Create the table in design view with fields such as BookID (Primary Key), Title, Author, Genre, and YearPublished.

  2. Add appropriate data types for each field (e.g., Text for Title, Number for YearPublished).

  3. Add some records in datasheet view.

- **Integrated Activity:** Have students visually design and conceptualize a relational database by sketching how tables relate to each other (e.g., Book table linked to a Borrower table via BorrowerID).

Expected Learning Outcomes:

By the end of the lesson, students will:

1. Demonstrate proficiency in opening and modifying tables in both datasheet and design view.

2. Understand and use appropriate data types for different fields.

3. Create tables in design view and set primary keys to ensure data integrity.

4. Modify the structure of tables to meet specific data requirements.

5. Understand how tables can be related in a database.

Assignments & Assessments:

1. **Assignment:**

   o Create a table for a "Student Management System" that includes fields for StudentID (Primary Key), FirstName, LastName, Age, DateOfBirth, and Grade. Set appropriate data types and add records to the table.

2. **Assessment:**

   o Short quiz on identifying and explaining the various data types in Access.

   o Practical test where students modify an existing table by adding new fields and changing data types.

Remedial Measures:

1. **Extra Practice:** Provide additional exercises for students struggling with modifying tables and setting primary keys, such as creating more complex tables or adding relationships between tables.

2. **Guided Assistance:** Offer one-on-one or small group sessions for students who need more help with specific tasks (e.g., setting data types or primary keys).

3. **Online Resources:** Share video tutorials and online materials on how to perform tasks in Access, reinforcing key concepts.
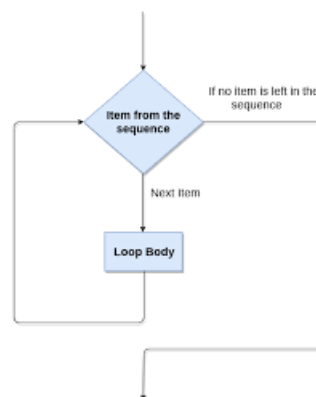
Month-September

First term Examination (2025-26)

Revision of the following Chapters will be done

- **Computer Network**
- **Links and Tables in HTML 5**
- **Links and forms in HTML**
- **Table in Access**

Month-October

Chapter- Looping in Python

Learning Objectives:

- **Understand the concept of loops and their importance in programming.**

- **Learn the syntax and application of while and for loops.**

- **Learn how to use loop control statements such as break, continue, and pass.**

- **Understand the range function and its utility in loops.**

- **Learn to identify and avoid infinite loops.**

Teaching Aids/Materials Required:

- **Python IDE (e.g., PyCharm, Visual Studio Code, or Jupyter Notebook).**

- **Projector or smartboard for displaying code examples.**

- **Printed handouts with example problems and solutions.**

- **Computers or laptops for each student with Python installed.**

Teaching Methodology:

- **Introduction (10 minutes):**

  - **Begin by explaining what loops are and why they are important in programming.**

  - **Briefly introduce while and for loops with a simple explanation.**

- **Lecture (20 minutes):**

  - **While Loop:**

    - **Explain the structure and working of a while loop.**

- Provide examples and demonstrate how the loop executes until a condition is false.
- Show how while loops can result in infinite loops if not properly controlled.
  - **For Loop:**
    - Explain how a for loop works, especially in Python when iterating over a range of numbers or a collection (list, string).
    - Demonstrate how to use for loops with range() and iterating through lists/tuples.
  - **Loop Control Statements:**
    - Introduce break, continue, and pass within loops.
    - Provide examples of each statement and demonstrate their effect on the loop.
  - **Range Function:**
    - Explain the range() function, its arguments, and how it's used with for loops.
    - Provide examples of different ways to use the range() function.

- **Interactive Session (15 minutes):**
  - Students will be given simple problems to solve in pairs. They will write and run loops in Python to solve the problems, using while, for, and range functions.

- **Class Discussion (10 minutes):**
  - Discuss common mistakes in loops, such as creating infinite loops and forgetting to update the loop variable.
  - Highlight how to avoid such mistakes.

Art & Integrated Activity/Project/Practical:

- **Looping Project:**
  - Students will create a program that asks the user to input a number, and the program will use a loop to calculate and print the factorial of the number.
  - Integrate a drawing task: In this task, students will use a for loop to print a pattern (e.g., stars, pyramid, etc.) on the console.

- **Practical Exercise:**
  - Pattern Printing: Create a project where students generate a number or alphabet-based pattern using loops.
  - Problem-Solving: Write a program to print all even numbers between 1 to 100 using a while loop.

Expected Learning Outcomes:

- Students will be able to understand and use while and for loops effectively.
- Students will demonstrate proficiency in using loop control statements (break, continue, pass).
- Students will understand and apply the range() function in loops.
- Students will be able to identify and avoid infinite loops.
- Students will be able to implement loops to solve real-life problems (e.g., calculating factorial, printing patterns).

Assignments & Assessments:

- **Assignment 1: Write a program that uses a while loop to print the Fibonacci series up to a given number.**

- **Assignment 2: Use a for loop to print a table of numbers from 1 to 10.**

- **Quiz: A short quiz to test understanding of loop concepts, the syntax of while and for loops, and loop control statements.**

Assessment Criteria:

- **Correctness of code.**

- **Effective use of loops in solving problems.**

- **Understanding of loop control statements.**

Remedial Measures:

- **For Students Struggling with Concepts:**

  - **Provide more real-world examples where loops are applicable (e.g., iterative tasks, game loops).**

  - **Encourage one-on-one or group sessions to explain tricky concepts like infinite loops.**

- **For Students Who Finish Early:**

  - **Assign additional pattern printing tasks.**

  - **Have them explore and solve more complex loop-based problems, such as nested loops or looping through multidimensional lists.**

Month-November

Chapter- E-Commerce and Computer ethics

Learning Objectives:

- Understand the concept of E-Commerce and its significance in the digital economy.

- Identify and categorize different types of E-Commerce.

- Recognize and analyze ethical issues related to E-Commerce.

- Learn strategies on how to avoid becoming a victim of online fraud or unethical practices.

- Know the steps to take if one becomes a victim of online fraud or unethical practices.
- Understand the importance of computing ethics in modern society.

Teaching Aids / Materials Required:

- Whiteboard and markers
- Projector and screen for PowerPoint presentations or videos
- Internet connection (for demonstrations and videos)
- Printed handouts summarizing key points
- Case studies on E-Commerce fraud and ethical dilemmas
- Computers/laptops/tablets for group research or exercises

Teaching Methodology:

- Introduction :
  - Start with a brief discussion to engage students about their experience with online shopping and services.
  - Define E-Commerce and its role in today's business world.
- Explanation and Discussion :
  - Break down the concept of E-Commerce into categories, explaining each type (B2B, B2C, C2C, C2B, etc.).
  - Present ethical issues related to E-Commerce, including online privacy concerns, intellectual property issues, and digital fraud.
  - Use case studies or real-life examples to highlight how unethical practices happen in E-Commerce.
- Interactive Activity :
  - Show a video or give a scenario where students have to identify ethical or unethical actions in E-Commerce transactions.
  - Discuss how individuals can protect themselves from becoming victims of online fraud and the actions to take if they fall victim.
- Group Work :
  - Divide the class into small groups. Assign each group a specific ethical dilemma or E-Commerce fraud case to discuss and present solutions or preventive measures.
- Conclusion :
  - Summarize the key points of the lesson.
  - Reinforce the importance of ethical practices in E-Commerce and the role of computing ethics in technology.

Art & Integrated Activity/Project/Practical:

- Project:
  - Students can design a simple E-Commerce website prototype, ensuring that ethical guidelines are followed, including user privacy policies and secure payment options.
  - Create a pamphlet or poster about "How Not to Be a Victim of E-Commerce Fraud," using creative design and information.
- Practical:
  - Conduct an online simulation exercise where students browse and make purchases on mock E-Commerce websites, focusing on security practices and identifying common ethical issues (e.g., deceptive advertising, fake reviews).

Expected Learning Outcomes:

- Students will be able to define and classify E-Commerce.

- Students will be able to identify key ethical issues in the context of E-Commerce.

- Students will understand how to avoid becoming victims of online fraud and what to do if they become victims.

- Students will appreciate the importance of computing ethics in the digital age.

- Students will be able to create secure and ethical E-Commerce environments.

Assignments & Assessments:

- Assignments:

    o Write a 500-word essay on the ethical implications of E-Commerce in society.

    o Create a list of best practices for consumers to avoid falling victim to online fraud.

- Assessments:

    o Group presentation on a selected E-Commerce fraud case and proposed ethical solutions.

    o A short quiz at the end of the lesson to assess students' understanding of E-Commerce types and ethical concerns.

Remedial Measures:

- Provide additional reading material on E-Commerce and ethical issues for students who need more background information.

- Arrange one-on-one or small group sessions for students who struggle with understanding ethical implications or practical applications.

- Use more visual aids like infographics or videos to clarify complex concepts for students who may have difficulty grasping theoretical content.

Month-December

Chapter- Artificial Intelligence-Robotics

Learning Objectives:

By the end of the lesson, students will be able to:

1. **Define robotics and understand its core concepts.**

2. **Identify the components that make up a robot.**

3. **Explain the characteristics that define a robot.**

4. **Differentiate between various types of robots and their applications.**

5. **Understand the diverse uses of robots in various industries.**

6. **Explore career opportunities within the field of robotics.**

Teaching Aids/Materials Required:

1. **Whiteboard/Smartboard**
2. **Projector and Laptop for Presentations**
3. **Robotics kits or working robots (if available)**
4. **Printed handouts/worksheets with diagrams and definitions**
5. **Videos or animations showing different types of robots and their uses**
6. **Internet access for research and examples**
7. **Printed career path charts related to robotics**

Teaching Methodology:

1. **Introduction (5 minutes):**
   - **Begin the lesson by engaging students with an interesting question: "What do you think when you hear the word 'robot'? Can a robot think like a human?"**
   - **Provide a brief overview of robotics, its significance, and relevance in today's world.**

2. **Interactive Lecture (15 minutes):**
   - **Use a PowerPoint presentation to cover the definition of robotics, the components that make up a robot, and the characteristics of robots.**
   - **Show images/videos of robots to highlight the concepts being discussed.**
   - **Explain each type of robot and its uses in industries like manufacturing, healthcare, and space exploration.**

3. **Group Discussion (10 minutes):**
   - **Break students into small groups and assign each group a type of robot (e.g., industrial robot, medical robot, autonomous robot).**
   - **Have them discuss how their assigned robot works and its uses, and then present their findings to the class.**

4. **Hands-On Activity/Practical (15 minutes):**
   - **If available, allow students to interact with a basic robotics kit or a demonstration robot. Alternatively, show a video of robots in action in various industries.**
   - **Students can draw a simple diagram of a robot, labeling its components.**

5. **Conclusion (5 minutes):**
   - **Recap the key points of the lesson, emphasizing the importance of robotics in the modern world.**
   - **Encourage students to think about how robotics might evolve in the future.**

Art & Integrated Activity/Project/Practical:

- **Project: Create a "Robot of the Future" using art supplies. Students can draw or model robots that they think will be built in the future. They should include labels for each part of the robot, and explain its functions. This will integrate creativity with their understanding of the components and functions of robots.**

- **Practical (if applicable): If robots or robotics kits are available, students will assemble a basic robot model or work with a pre-built robot to perform simple tasks.**

Expected Learning Outcomes:

1. Students will be able to define and explain key terms related to robotics, including what constitutes a robot and its characteristics.

2. Students will be able to identify the components of a robot and describe their functions.

3. Students will be able to distinguish between different types of robots and discuss their uses in various sectors.

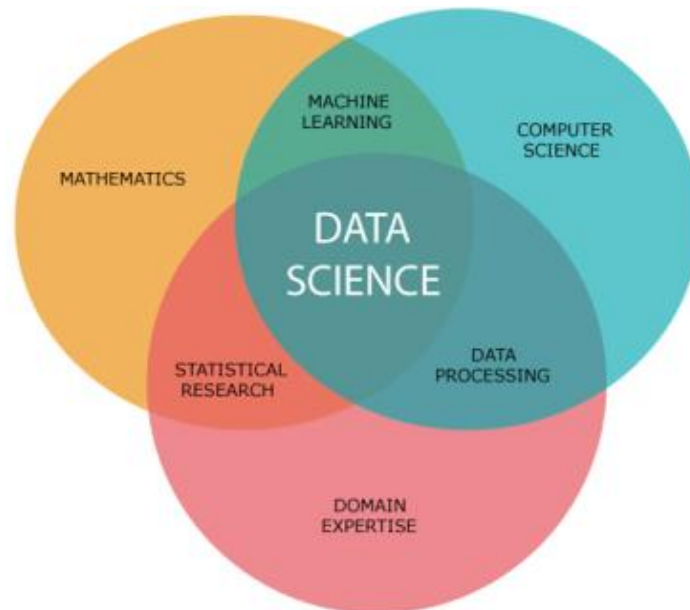4. Students will gain awareness of potential careers in the field of robotics.

Assignments & Assessments:

1. **Assignment 1:**
   o Write a 1-2 page essay on the impact of robots in a specific industry of your choice (e.g., healthcare, agriculture, manufacturing).
   o Include at least 3 types of robots used in that industry and how they are improving efficiency.

2. **Assignment 2:**
   o Complete a worksheet with the following tasks:
     ▪ Match types of robots with their uses.
     ▪ Label the components of a robot in a given diagram.

3. **Quiz/Assessment:**
   o Multiple-choice or short-answer quiz covering the topics discussed in class (definition of robotics, characteristics of robots, types of robots, career paths in robotics).

Remedial Measures:

1. **For students struggling with key concepts:**
   o Provide additional visual aids or videos explaining basic concepts of robotics.
   o Offer one-on-one or small group sessions to reinforce learning.
   o Simplify complex terminology by using analogies (e.g., comparing robot components to parts of the human body).

2. **For students requiring additional practice:**
   o Provide extra worksheets or online resources that allow them to further explore the different types of robots.
   o Assign a project that requires creating a robot prototype (could be a paper model or using a simple building kit).

3. **Peer Learning:**
   o Encourage students who grasp the material more quickly to assist their peers in understanding the topics through group activities and discussions.

Learning Objectives: By the end of this lesson, students will be able to:

1. **Define what data and data science are.**

2. **Understand the significance of data science in various fields.**

3. **Identify key applications of data science.**

4. **Recognize the importance of data visualization in data analysis.**

5. **Explore potential career paths within the field of data science.**

Teaching Aids / Materials Required:

- **Whiteboard and markers**

- **Projector and screen**

- **Laptop or computer with internet access**

- **Data Science-related videos or tutorials**

- **Infographics on data science applications**

- **Example datasets for practical exercises**

- **Printed handouts on data science concepts and career paths**

Teaching Methodology:

1. **Introduction (15 minutes):**

   o **Begin with a class discussion on data and its significance. Ask students where they encounter data in their daily lives.**

   o **Introduce the concept of data science, emphasizing its relevance in various industries.**

2. **Lecture (20 minutes):**

   o **Explain what data science is and its role in extracting insights from data.**

   o **Discuss the reasons why data science is critical in today's data-driven world.**

- o Introduce key applications of data science (e.g., healthcare, business, sports, entertainment).
- o Show videos or examples of data visualization tools (e.g., Tableau, Power BI) to highlight its importance in conveying insights.

3. **Interactive Discussion (10 minutes):**
   - o Ask students to brainstorm potential career options in data science and how these careers vary in different industries.
   - o Display a list of career paths (e.g., Data Analyst, Data Scientist, Machine Learning Engineer, etc.), discussing each role's responsibilities.

4. **Practical Application (20 minutes):**
   - o Provide a simple dataset for students to analyze. Demonstrate basic data visualization using a tool like Google Sheets or Excel.
   - o Guide students to create basic graphs (bar charts, line graphs) from the dataset to visualize trends or patterns.

Art & Integrated Activity/Project/Practical:

- **Data Visualization Project:**
  - o Divide students into small groups and assign each group a real-world dataset (e.g., weather data, sales data, sports statistics).
  - o Have each group create a data visualization (chart, graph, or infographic) that presents insights from their dataset.
  - o Groups will present their findings to the class, explaining their visualization choices and insights.

Expected Learning Outcomes: By the end of the lesson, students will:

1. Demonstrate an understanding of data and data science concepts.
2. Explain the relevance of data science in various fields.
3. Apply basic data visualization techniques to real-world datasets.
4. Identify and discuss potential careers in the data science industry.

Assignments & Assessments:

1. **Assignment:**
   - o Create a report on a specific application of data science in an industry of their choice (e.g., healthcare, entertainment, sports).
   - o Include a data visualization that supports the analysis.

2. **Assessment:**
   - o Participation in the group project and class discussions.
   - o Evaluation of the data visualizations created during the practical session (for clarity, accuracy, and creativity).

Remedial Measures:

1. **Extra Resources:**
   - o Provide additional reading materials or video tutorials on basic data science concepts for students who need more support.
   - o Offer one-on-one sessions to review key concepts and assist with assignments.

2. **Peer Learning:**
   - o Pair students who grasp the concepts quickly with those who need more assistance during the practical exercises for collaborative learning.

3. **Follow-up Quiz:**

   o **Conduct a short quiz on key data science terms, applications, and career paths in the next class to reinforce the concepts learned.**

Month-February

Revision of the following Chapters will be done

- **Looping in Python**
- **E-Commerce and computer ethics**
- **Artificial Intelligence-Robotics**
- **Data Science**

Month-March

Final Examination