Class 9

LESSON PLAN

Artificial Intelligence

Part-A: Employability Skills

1. Communication Skills-I

Teaching Objectives

Students will learn about

- What is Communication?
- Factors Affecting Perspectives in Communication
- Effective ways of Communication
- 3P's of Public Speaking
- Phrases
- Construction of a Paragraph
- Use of Articles
- Perspectives in Communication
- Types of Communication
- Writing Skills
- What is a Sentence?
- Parts of Speech
- When no Articles are used

Teaching Plan

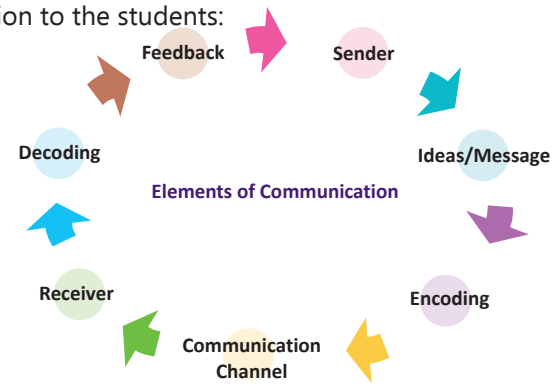
Number of Periods
Theory
10

Before starting the chapter, give an introduction of communication to the students.

Tell the students that the word 'communication' is derived from the Latin word communicare, meaning "to share". It is defined as a way of conveying a meaningful message from one entity to another.

Explain the elements of communication to the students:

- Sender
- Ideas/Message
- Encoding
- Communication Channel
- Receiver
- Decoding
- Feedback



Explain the importance of communication to the students and that it is a two way process. It is important for many reasons like:

- Information
- Motivation
- Persuasion
- Brings Clarity

Define the perspective of communication to the students in detail. Tell the students that perspective is the fixed idea or thinking that affects our communication. It can be a sender or a receiver of the message affecting the interpretation of the message thus altering the intended meaning of it.

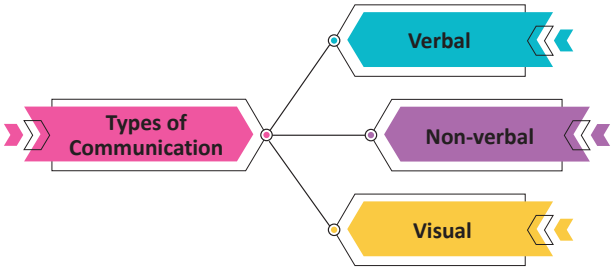
Explain the factors affecting the perspectives in communication which are:

- Language
- Visual Perception
- Past Experience
- Prejudice
- Feelings
- Environment
- Culture

Share to the students that in order to ensure the communication in the most effective and engaging manner we need to have a clear vision of 7 C's:

- Clear
- Concise
- Concrete
- Correct
- Coherent
- Complete
- Courteous

Tell the students about the types of communication in detail:



Also, define the types of verbal communication which are Oral and Written Communication. After this, explain the types of non-verbal communication which are hand movement, sign language, facial expression, eye contact, touch, and body posture.

Share the 3P's of Public Speaking in detail for better understanding:

- Prepare
- Practice
- Perform

Share the meaning and purpose of writing skills with the students that it is an ability to express your ideas or thoughts. A good writing skill uses perfect words to express the accurate meaning of the message with more clarity. Also explain the types:

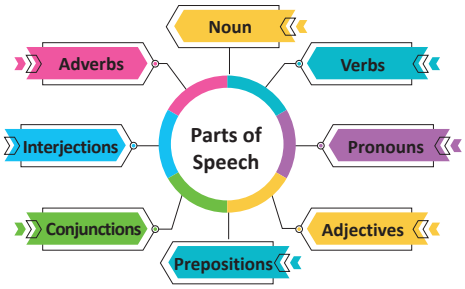
- Capitalization
- Punctuation Marks

Define the meaning of phrase and what is a sentence with the students for better clarity. Also, define:

- Rules for writing a sentence
- Parts of a sentence
- Types of sentences

Tell the students about the construction of a paragraph along with the rules for writing a paragraph in detail.

Share with the students about the part of speech in detail:



Define the use of articles which are Definite – The and Indefinite – A & An to the students. Also, explain the when no articles are used to the students.

Extension

Ask the students some oral questions based on this chapter.

Q. What is communication?
Q. What are the elements of communication?
Q. Write the importance of communication skills.
Q. What is the perspective of communication?
Q. What are effective ways of communication?
Q. Define the types of communication.
Q. What is verbal communication?
Q. What is non-verbal communication?
Q. What are 3P's of public speaking?
Q. Define writing skills.
Q. What is a phrase?
Q. What is a sentence?
Q. Define the construction of a paragraph.
Q. Define parts of speech.
Q. Define the use of article.

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 31 to 37 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 37 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

2. Self Management Skills-I

Teaching Objectives

Students will learn about

- ☞ Self-Management
- ☞ Who am I?
- ☞ Steps for Building Self-Confidence
- ☞ Factors That Help in Building Self-Confidence
- ☞ Self-Confidence Building Tips
- ☞ Self-Management Skills
- ☞ Self-Confidence
- ☞ Qualities of Self-Confident Person

Teaching Plan

Number of Periods
Theory
10

Before starting the chapter, tell the students self-management means managing yourself. It's taking the responsibility of managing our own behaviour and actions.

Tell the students that self-management helps you to have a good control on your strength and weakness. Nothing can make you sad or unhappy unless you allow your emotions to flow in that direction.

Explain the students that self-management skill is the ability to regulate your feelings and actions to achieve your goals independently and helps in the development of a strong personality. Some of the important self-management skills are:

- Self-Awareness
- Self-Confidence
- Self-Motivation
- Self-Control
- Self-Commitment
- Problem Solving
- Positive Thinking
- Stress Management
- Time Management
- Organisational Skills

Share with the students that when you have a better understanding of yourself, you learn to manage with good self-management skills and then it becomes easy to find out your strong and weak points. Also, make sure:

- Knowing Yourself
- Knowing Your Strengths
- Knowing Your Weaknesses

Share with the students about the following in detail:

- Self Confidence
- Steps for building Self-Confidence
- Qualities of Self-Confident Person
- Factors that help in building Self-Confidence
- Self-Confidence Building Tips

Extension

Ask the students some oral questions based on this chapter.

Q. What is self-management?

Q. What are the positive rules of self-management?

Q. Write the self-management skills required.
Q. Explain how to know your strength.
Q. Write the steps to identify your strengths.
Q. Explain how to know your weakness.
Q. Write the steps to identify your weakness.
Q. What is self-confidence?
Q. Write the steps of building self-confidence.
Q. Define qualities of self-confident person.
Q. What are the factors that help in building self-confidence?
Q. Define the self-confidence building tips.

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 46 to 51 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 52 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

3. ICT Skills-I

Teaching Objectives

Students will learn about

- ICT
- Input Devices
- Processing Device— Central Processing Unit (CPU)
- Output Devices
- Measuring Unit for Memory
- Motherboard
- Types of Operating Systems
- Booting
- Windows 10—An Operating System
- Files and Folders in Windows 10
- Managing Files and Folders in Windows 10
- Keyboard Operations in Windows 10
- Brief History of the Internet
- Terminologies of the Internet
- Applications of Internet
- Microsoft Edge
- What is a Computer?
- Computer Memory
- Peripheral Device Ports
- Understanding Operating System
- Functions of an Operating System
- Procedure for Starting a Computer
- Common Desktop Operations
- Mouse Operations in Windows 10
- Shutting down the Computer
- How does Internet Work
- Protocols
- Components of Internet
- Email

- ☞ Creating an Email Account
- ☞ Introduction to Social Media
- ☞ Composing an Email
- ☞ Digital India

Teaching Plan

Number of Periods
Theory
10

Before starting the chapter, define the meaning of ICT to the students in detail along with proper examples.

Tell the students that Information Technology is the use of hardware, software and networking technology for accessing, storing, retrieving and transmitting the information.

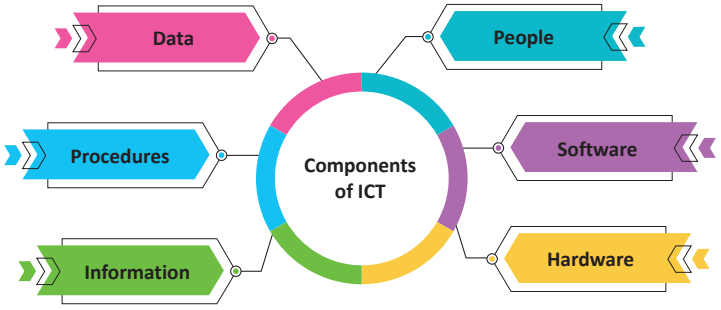
Explain the role of ICT to the students:

1. In Personal life
   - Shopping
   - Communication
   - Entertainment
   - Education
   - Healthcare
   - Socializing
   - Source of Information
2. In Professional life
   - Maintenance of Records
   - E-Commerce
   - Handling of Accounts
   - E-Banking

Define the different ICT tools to the students in detail:

- Computers
- Radio and Television
- Internet and Emails
- Smartphones and Tablets

Share the components of ICT with the students in details:



Define what is a computer to the students and the basic operations of a computer which are Input, Process, Output and Storage. Also, share the IPO Cycle with example to the students.

Share the characteristics of a computer with the students which are:

- Speed
- Accuracy
- Reliability
- Storage
- Versatile

Explain to the students all the input devices in detail along with the brief working of these devices:

- Keyboard
- Mouse
- Scanner
- Light Pen
- Touchscreen
- Microphone
- Barcode Reader
- MICR

Tell the students that after taking the input from the input devices, the information is sent for processing. The computer uses its brain to process the information. The computer's brain is called the CPU or Central Processing Unit.

Explain to the students all the output devices in detail along with the brief working of these devices:

- Monitor
- Printer
- Plotter
- Speakers
- Projector

Explain the computer memory to the students in detail and also share that measuring unit for memory:

- Primary Memory
- Secondary Memory

Explain the following to the students in detail with proper example:

- Peripheral device ports
- Motherboard
- Operating System (UNIX, DOS, Windows, Linux and Mobile Operating System)
- Types of OS

Tell the functions of OS to the students along with booting and procedure for starting a computer. Also, share that Windows 10 is an operating system designed by Microsoft and released in 2015. It supports graphical user interface where work can be done easily by using simple mouse clicks.

Demonstrate to the students with the labelled steps for each action:

- Changing wallpaper
- Setting Screensaver
- Changing system time/date
- Controlling Speaker volume

Share the information about files and folders in Windows 10 with the students. Also, demonstrate to the students with the labelled steps for each action:

- Creating a file
- Creating a folder
- Rename a file/folder
- Deleting a file/folder
- Moving a file/folder
- Copy and Paste a file/folder
- Searching a file/folder

Share the mouse operations in Windows 10 with the students:

- Single-click
- Double-click
- Right-click
- Drag and drop
- Hovering

Tell the keyboard operations in Windows 10 to the students:

Shortcut keys	Task to be performed
Ctrl+N	Creating a new file
Ctrl+O	Open a file
Ctrl+S	Save a file
Ctrl+P	Print
Ctrl+X	Cut
Ctrl+V	Paste
Ctrl+F	Find option
Ctrl+C	Copy

Define the following to the students:

- Shutting down the computer
- How does Internet work
- Applications of Internet
- Email
- Introduction to Social Media
- Terminologies of Internet
- Components of Internet
- Creating an Email Account
- Brief history of Internet
- Protocols
- Microsoft Edge
- Composing an Email

Extension

Ask the students some oral questions based on this chapter.

Q. What is ICT?

Q. Define the following:

a. Shopping
b. Communication
c. Entertainment
d. Education
e. Healthcare
f. Socializing
g. Source of Information
h. Maintenance of Records
i. E-Commerce
j. Handling of Accounts
k. E-Banking

Q. Define different ICT tools.

Q. Define characteristics of ICT tools.

Q. Write about different devices of the following:

a. Input devices
b. Processing device
c. Output device
d. Storage device

Q. Write the steps for the following:

a. Changing wallpaper
b. Setting Screensaver
c. Changing system time/date
d. Controlling Speaker volume
e. Creating a file
f. Creating a folder
g. Rename a file/folder
h. Deleting a file/folder
i. Moving a file/folder
j. Copy and Paste a file/folder
k. Searching a file/folder

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 93 to 101 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 101 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

4. Entrepreneurial Skills-I

Teaching Objectives

Students will learn about

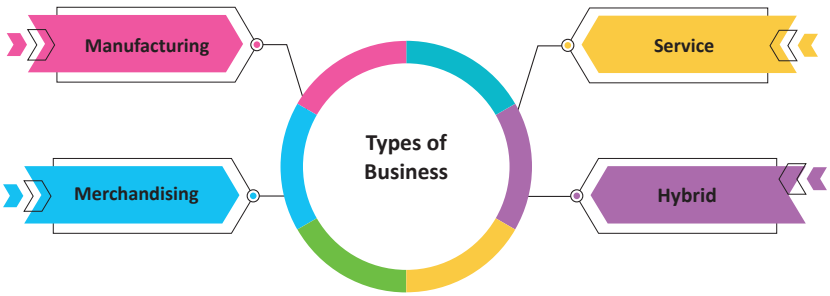
- Definition of Business
- Types of Business
- Important Features of Different Types of Business
- Forms of Business Organisations
- Steps of Starting a Business
- Who is an Entrepreneur?
- What is Entrepreneurship?
- Entrepreneurship Development
- Characteristics of an Entrepreneur
- Role of an Entrepreneur
- Core Skills of a Successful Entrepreneur
- Challenges of an Entrepreneurship
- Rewards of an Entrepreneurship
- Difference between Businessman and Entrepreneur

Teaching Plan

Number of Periods
Theory
15

Before starting the chapter, tell the students that a business is a state of being busy as an individual or as an organization in a profit earning economic activity.

Share the types of business in detail with the students:



Explain the important features of different types of business in detail to the students:

	Manufacturing	Service	Merchandising
Activity Involved	Production of goods using raw material.	Provides services of different types.	Buying goods at whole price and selling at retail price.
Storage	Raw material, intermediate and finished products are stored.	Service cannot be stored in warehouses or boxes.	Finished products are stored in warehouses.
Tangibility	Raw material, intermediate, finished products are all tangible.	Services are intangible as they cannot be touched.	Finished products are tangible.

	Manufacturing	Service	Merchandising
Staff	Skilled and unskilled labour.	Skilled professionals and experts.	Sales personnel.
Examples	Ultra Tech Cement Ltd, JSW Steel Ltd, Maruti Suzuki India Ltd, etc.	HDFC Bank, Zomato, Airtel, etc.	Grocery stores, retail clothing stores, etc.

Share the forms of business organizations with the students in details along with the advantages and disadvantages:

- Sole Proprietorship
- Partnership
- Corporation
- Limited Liability Company (LLC)

Define the steps for starting a business to the students. Also, explain the meaning of Entrepreneur along with the Entrepreneurship and its development.

Share the following to the students for a better understanding in details:

- Process of its development
- Characteristics of an Entrepreneur
- Role of an Entrepreneur
- Core Skills of a successful Entrepreneur
- Challenges of an Entrepreneurship
- Rewards of Entrepreneurship

Demonstrate the difference between Businessman and Entrepreneur:

	Businessman	Entrepreneur
Meaning	A businessman is a person who starts a business based on an idea already existing in a society. For example, opening a grocery shop, mobile shop, etc.	An entrepreneur is a person who starts an enterprise with a new idea or concept. For example, selling products through online services.
Market Status	Market Player who creates his own place in the existing market	Market Leader who creates his own market
Risk Factor	Risk factor is less.	Risk factor is high.
Procedures	Businessman follows traditional procedures.	Entrepreneur follows unconventional procedures.
Competition	High.	Low.

Focus	Profits.	Customers, employees, profits and society.

Extension

Ask the students some oral questions based on this chapter.

Q. What is business?

Q. Define the types of business.

Q. Define the different forms of business.

Q. What is Entrepreneur?

Q. What is Entrepreneurship?

Q. Write the difference between Businessman and Entrepreneur.

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 114 to 121 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 121 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

5. Green Skills-I

Teaching Objectives

Students will learn about

- ☞ Environment
- ☞ Ecosystem
- ☞ Relationship Between Society and Environment
- ☞ Natural Resources
- ☞ Natural Resources Conservation
- ☞ Saving Environment using 3R's
- ☞ Factors Causing Environment Imbalance
- ☞ Green Economy
- ☞ Green Skills
- ☞ Green Projects in India

Teaching Plan

Number of Periods
Theory
5

Before starting the chapter, tell the students that Environment' word is derived from the French word 'Environia' which means "to surround". In simple terms, it refers to our surrounding consisting of physical, chemical and biological elements that maintain a balance between the living and non-living components.

Explain the difference between the natural and man-made environment to the students.

Share with the students that an ecosystem is defined as a community where living and non-living things interact with each other and their surrounding environment to form a balanced system. Also, tell them about the two components and two types of ecosystem:

- Biotic
- Abiotic
- Artificial
- Natural
- Terrestrial
- Aquatic

Share the relationship between society and environment with the students in detail.

Tell the students about natural resources and natural resources conservation. Also, tell them about the need to conserve our national resources.

Share with the students about how to conserve our natural resources:

- Water Conservation
- Soil Conservation
- Energy Conservation
- Food Conservation
- Forest Conservation

Explain the 3R's used for saving environment to the students which are:

- Reduce
- Reuse
- Recycle

Demonstrate the factors that causes environment imbalance to the students in details:

- Population Explosion
- Pollution
- Global Warming
- Mining Activity

Explain to the students about green economy and the characteristics of it. Also, share the components and importance of green economy.

Show the students about purpose of Green Skills in details along with the green jobs and green projects in India.

Extension

Ask the students some oral questions based on this chapter.

Q. What is environment?
Q. What is ecosystem?
Q. Define the relationship between society and environment.
Q. What are natural resources?
Q. Define natural resource conservation.
Q. Define the 3R's used for saving environment.
Q. Write the factors causing environment imbalance.
Q. What is global warming?
Q. Define mining activity.
Q. What is green economy?
Q. What are green skills?

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 137 to 142 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Page 142 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Class 9

LESSON PLAN

Artificial Intelligence

Part-B: Subject Specific Skills

1. Introduction to AI

Teaching Objectives

Students will learn about

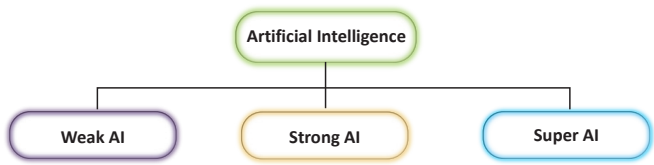
- What is Intelligence?
- Types of AI
- AI Around Us
- History of AI
- Importance of AI
- Future of AI
- Domains of AI
- What are Sustainable Development Goals (SDGs)?
- Role of AI to Achieve SDGs
- Dynamic Waves in AI Research
- Case Study of AI Start-ups in India
- AI Bias & AI Access
- Advantages of AI
- Conclusion
- Introducing AI
- How do Machines Become Intelligent?
- What is Not AI?
- World Famous AI Machines
- AI in India
- Human-Machine Interaction
- The Concept of Smart Living
- Applications of AI in Real-Life
- Careers in AI
- AI Ethical Issues and Concerns
- AI Access
- Disadvantages of AI

Teaching Plan

Number of Periods	
Theory	Practical
10	8

Before starting the chapter, tell the students that Intelligence is the ability to learn from experience, to recognize problems and to solve problems. According to **Sternberg** and **Sternberg**— "Intelligence is the capacity to learn from experience, using metacognitive processes to enhance learning, and the ability to adapt to the surrounding environment."

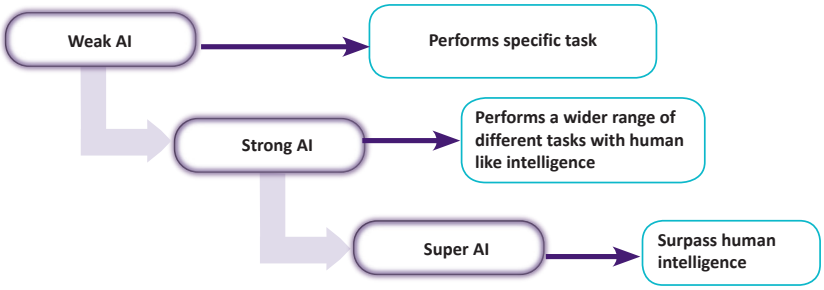
Introduce the student with AI and tell them that **Artificial Intelligence (AI)** is a branch of computer science that simulate human intelligence into machines, especially in computer systems, so that they can think and perform actions similar to humans.



Explain the types of AI to the students with the help of proper examples.

Define the meaning and purpose of following AI to the students:

- Weak AI
- Strong AI
- Super AI



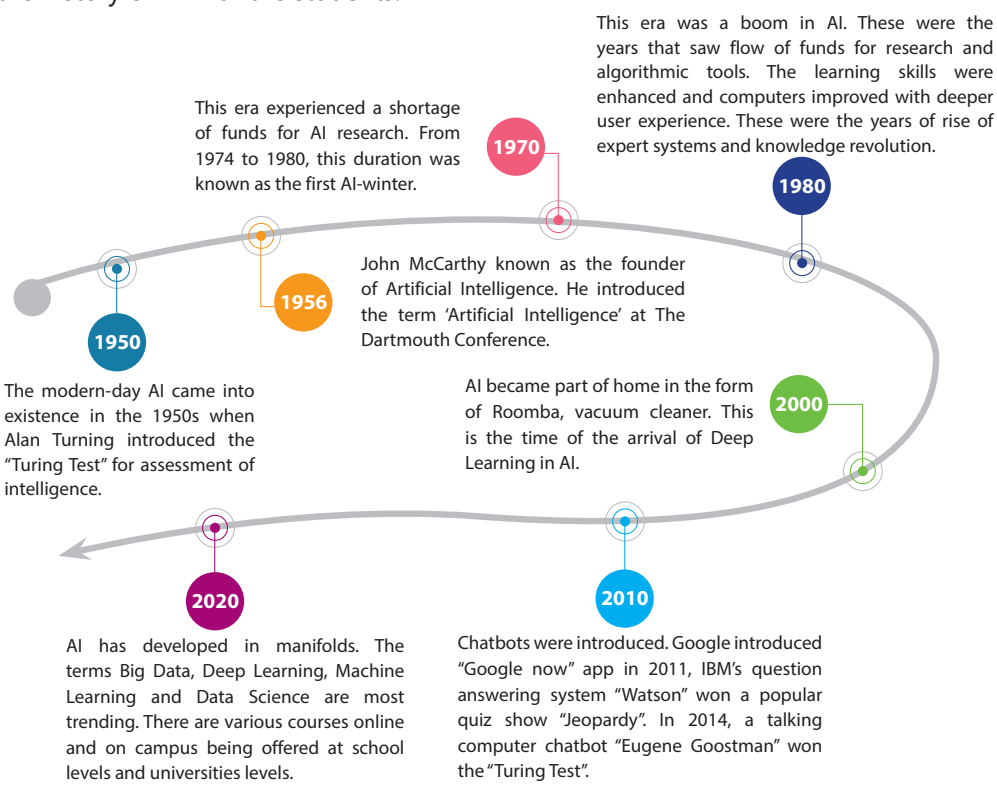
Explain the students about how machines became intelligent to the students.

Share the details about AI around us in detail with the students:

- Smartphones
- Email Spam Filters
- Virtual Assistants
- Social Media
- Music and Media Streaming Services
- Video Games
- Navigation
- Security and Safety
- Social Media Filters

Explain to the students about what is not AI in detail with proper examples.

Share the history of AI with the students:



Tell the students about some world-famous AI Machines with detail and purpose:

- IBM Watson
- Sophia
- Chatbots
- Honda Asimo
- Boston Dynamics AI Robot

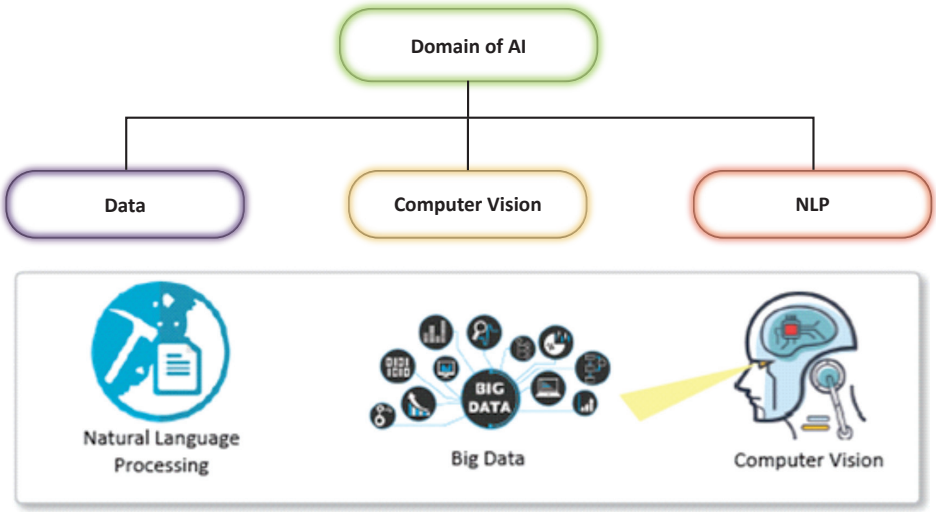
Explain the students that AI has impacted all the fields and sectors. It has changed the conventional functioning of machines. AI means equipping the machines with the power to think and make decisions just like human beings.

Tell them that AI as a technology has evolved in every field. It is the fastest growing sector with India having a biggest stake in AI development. This technology has its roots from our country's leading technology institutes. These institutes have initiated and encouraged AI researchers and start-ups.

Explain the Future of AI to the students with the concept that is being planned in fields.

Explain the meaning of Human-Machine Interaction and also tell the brief history of HMI to the students in details.

Explain the Domains of AI to the students in details along with the usage/ application of the same.



Define Natural Language Processing (NLP) to the studentsand tell the usage of the same.

Tell the students about Data and explain the usage of the same in the field of AI.

Share the information with the students about Computer Vision along with the applications of Computer Vision.

Explain the meaning and purpose of Smart Homes to the students. Also, tell them how these devices are beneficial like:

- Power Saver
- Increased energy Efficient
- Protect Home and its Belongings
- Interactive Home
- One Point Access
- Flexibility
- Remote Control
- Climate Control
- Protection

Share the devices which are used in smart homes to the students:

- Smart Hubs
- Video Doorbells
- Smart Cameras
- Smart Smoke Detectors
- Smart Lighting
- Smart Thermostats
- Smart Speakers
- Ego Lawnmower and Eve Aqua
- Smart Remote Controllers

Briefly explain all the SDGs in detail along with their motives and purpose:

Explain the applications of AI in real-life to the students in details.

Share the following in details with the students:

- Dynamic Waves in AI Research
- Careers in AI
- Case Study of AI Start-ups of India
- AI Ethical issues and concerns
- AI Bias
- AI Access
- Advantages of AI
- Disadvantages of AI
- Conclusion

Ask the student to solve the exercise given on different pages as **AI Reboot**.

Ask the students to solve the task given on different pages as **AI Task**.

Make sure to ask the students to scan and watch the video given on different pages. Encourage the students to make presentation on the topic learned and discuss in class.

Encourage the students to complete the Ice Breaker Activity given on different pages for learning by doing.

Extension

Ask the students some oral questions based on this chapter.

Q. What is intelligence?
Q. What is AI?
Q. Explain the types of AI.
Q. How do machines become intelligent?
Q. What is not AI?
Q. What is the future of AI?
Q. What is HMI?
Q. What is the importance of AI?
Q. Define domains of AI.

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on pages 155, 157 to 160 on their own under the name **AI Game** after learning about the rules and basics.

After explaining the chapter, let the students do the exercises given on Pages 186 to 193 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Pages 193 and 194.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Pages 194 to 197 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity. Ask the students to think and answer the exercise as **AI Ready 1** given on page number 198.

2. AI Project Cycle

Teaching Objectives

Students will learn about

- AI Project Cycle Framework
- AI Ethics Practiced while Designing AI Projects
- Summary—AI Project Cycle
- Identifying the Stakeholders
- Problem Statement Template
- What is Data?
- Data Visualisation
- Different Ways to Visualise Data
- What is Modelling?
- Iterative Nature of Problem Scoping
- Setting Goals for an AI Project
- 4W's Problem Canvas
- Data Acquisition
- System Maps
- Data Visualisation Tools
- Visualise Data using Visualisation Tools

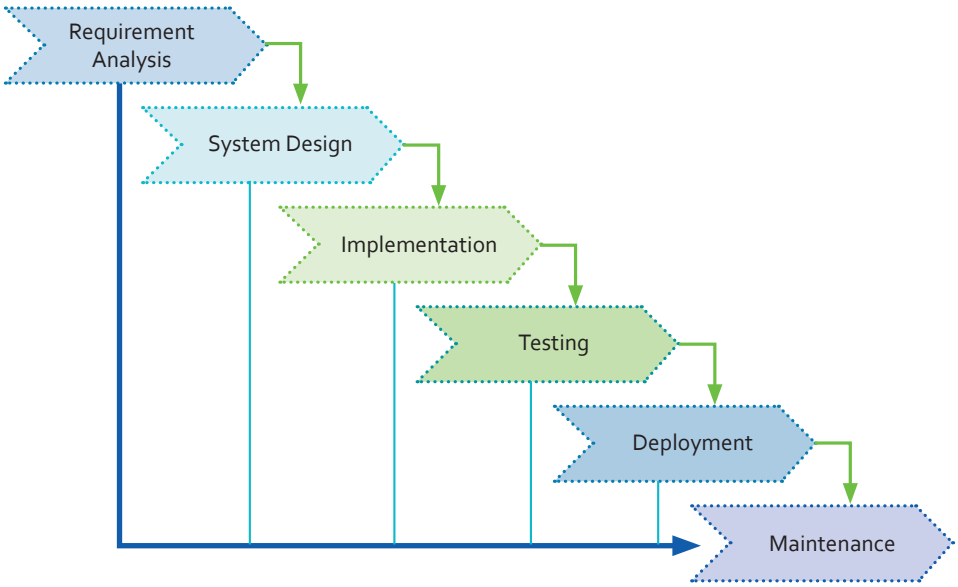
- ☞ Difference between AI, Machine Learning and Deep Learning
- ☞ Data Modelling Techniques
- ☞ Pixel It—Learning Based Approach
- ☞ AI Project Deployment
- ☞ Decision Tree—Rule Based Approach
- ☞ AI Project Evaluation

Teaching Plan

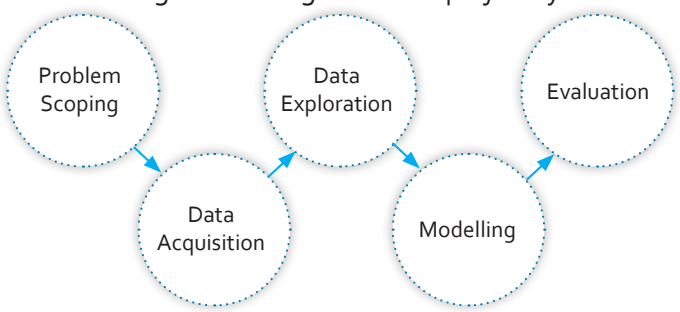
Number of Periods	
Theory	Practical
20	19

Before starting the chapter, tell the students AI is the top trending technology of this digital era. Most of the companies use AI to accomplish their mundane tasks and achieve their company's long-term goals.

Before learning about AI project cycle framework, first make sure that students learn about traditional software development cycle. Traditional software development follows the Software Development Life Cycle (SDLC). SDLC has the following stages:



Tell the students that the AI project cycle provides us with an appropriate framework which can lead us towards our goal. The following are the stages in an AI project cycle:



Explain the students about the iterative process is an important approach of problem scoping that helps in continually improving a design or product using an AI model. It involves creating a prototype and testing it, and repeating this cycle until you reach a desired AI model.

Share with the students the AI Ethics practiced while designing AI Projects along with the summary of AI Project cycle.

Tell the students that problem scoping is the term used to define the process of selecting a problem which we might want to solve using AI knowledge.

Make sure and let the students about how to identify the stakeholders.

Make sure to understand step by step how problem scoping is done we use another method here, known as 4Ws Problem Canvas. This canvas helps us in identifying 4 crucial parameters we need to know for solving a problem. The 4Ws here are listed as Who?, What?, When? and Why?

Define Data Acquisition and what is Data along with other facts to the students:

- Types of Data
- Data Features

Tell the students that a system map is a diagrammatic representation of a set of things working together. It focuses on the components and boundaries of a system. System map helps us to find relationships between different elements of the problem which we have scoped.

Explain to the students about the following in details and labelled steps:

- Data Visualisation
- Need of Visualising Data
- Data Visualisation Tools
- Different Ways to Visualise Data
- Visualise Data using Visualisation Tools

Share with the students about the following in details and labelled steps:

- What is Modelling?
- Difference Between AI, ML and DL
- Data Modelling Techniques
- Rule Based Approach
- Learning Based Approach
- Decision Tree
- Pixel It
- AI Project Evaluation
- AI Project Deployment

Ask the student to solve the exercise given on pages number 202 and 211 as **AI Reboot**.

Ask the students to solve the task given on pages number 202, 225 and 226 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q. What is 4Ws of Problem Canvas?

Q. Define the following:

- Data Visualisation
- Need of Visualising Data
- Data Visualisation Tools
- Different Ways to Visualise Data
- Visualise Data using Visualisation Tools
- Data Modelling Techniques
- Rule Based Approach
- Learning Based Approach
- Decision Tree
- Pixel It
- AI Project Evaluation
- AI Project Deployment

Q. What is Data Modelling?

Q. What is the difference between AI, ML and DL?

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 229 to 236 in the main course book as **AI Quiz**, **Exercise and Unsolved Questions**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Page 237.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Pages 237 to 239 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity. Ask the students to think and answer the exercise as **AI Ready** 2 given on page number 240.

Suggested Activity

Ask the students to learn more about Data Modelling and prepare a presentation on this topic.

3. Neural Networks

Teaching Objectives

Students will learn about

- ☞ Why do we use Neural Networks?
- ☞ Advantages of Neural Network
- ☞ Human Nervous System
- ☞ Applications of Neural Networks
- ☞ AI Models

- ☞ Relation between the Neural Network and Nervous System
- ☞ Working of Neural Networks
- ☞ Types of Neural Networks

Teaching Plan

Number of Periods	
Theory	Practical
4	2

Before starting the chapter, explain to the students about why do we use Neural Networks. Neural networks form a base of deep learning, a subfield of machine learning where algorithms are inspired by the structure of the human brain.

Tell them that the Neural networks are a series of algorithms used to recognise hidden patterns in raw data, cluster and classify it, continuously learn and improve. They are used in a variety of applications in stock markets, sales and marketing trends, risk assessment and fraud detection.

Explain the applications of Neural Networks in detail with proper examples to the students:

- Facial Recognition
- Forecasting
- Music Composition

Share the advantages of Neural Network to the students in detail:

- Parallel processing capability
- Data is stored on the entire network
- Capable of learning from non-linear and complex data

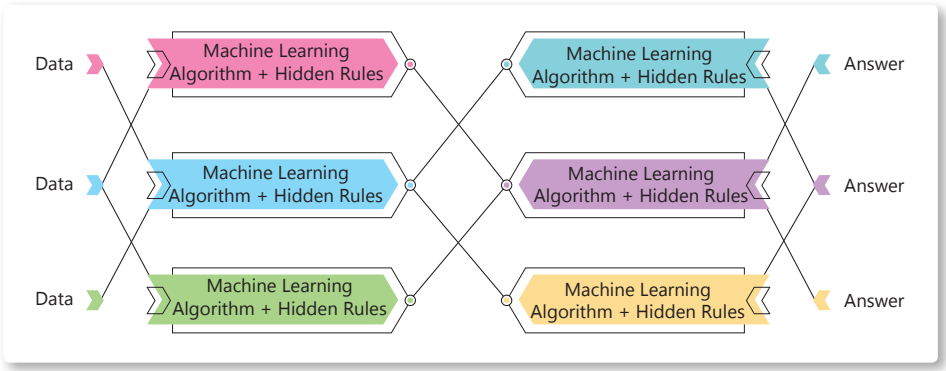
Tell the students about the AI Models to the students:

- Regression
- Classification
- Clustering

Define the meaning of Human Nervous System is made up of a complex network of specialised nerve cells known as neurons. Neurons are the building blocks of the nervous system and are responsible for communicating messages throughout the body.

Tell the students about that just like the human brain where all neurons are interconnected to one another, artificial neural networks also have a large number of artificial neurons(nodes) that are interconnected to one another in a sequence of layers of the networks.

Share the working of Neural Networks and tell them the Neural networks are made up of layers of neurons, just like the human brain that consists of millions of neurons. These neurons are the core processing units of the network.



Define the types of Neural Networks which are mainly two types of Neural Networks:

- Artificial Neural Network
- Biological Neural Network

Extension

Ask the students some oral questions based on this chapter.

Q. What is neural network?

Q. Write applications of neural network.

Q. What is face recognition?

Q. Define forecasting from the point of neural network.

Q Define music composition from the point of neural network.

Q. Define the following:

a. Regression

b. Classification

c. Clustering

Evaluation

Encourage the students to walk-through the chapter and ask them to play the game given on pages 246, 247 and 248 on their own under the name **AI Game** after learning about the rules and basics.

After explaining the chapter, let the students do the exercises given on Pages 249 to 253 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**. Tell them to solve the critical and computational skill developing exercises as **AI in Life** and **AI Deep Thinking** given on Page 254.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Pages 254 to 257 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity. Ask the students to think and answer the exercise as **AI Ready 3** given on page number 258.

Suggested Activity

Ask the students to research more about Neural Networks and play more similar game taught in this chapter.

4. Introduction to Python

Teaching Objectives

Students will learn about

- Steps Involved in Computer Problem Solving
- Control Structures
- Algorithm • Flowcharts
- Difference between Algorithm and Flowchart
- What is CodeCombat?
- What is Python?
- Important Features of Python
- Role of Python in Artificial Intelligence
- Important uses of Python
- Installing Python
- Working in Python
- Python Character Set
- Statements in Python
- Tokens
- Operator Precedence
- Comments in Python

- ☞ The print() Function
- ☞ Errors in Python
- ☞ Sequential Statements
- ☞ Iterative Statements
- ☞ The input() Function
- ☞ Control Statements
- ☞ Selection Statements
- ☞ Lists in Python

Teaching Plan

Number of Periods	
Theory	Practical
30	75

Before Tell the students that a computer is just a machine that gives the result based on the instructions or inputs given to it. In order to get a problem solved by a computer, we need to give step-by-step instructions to the computer.

Also, share with the students that these step-by-step instructions written in any programming language to do a specific task is known as a program.

Share with the students that to solve this problem of writing a program we follow some steps as given below:

1. Understanding the Problem
2. Analysing the Problem
3. Developing the Solution
4. Coding and Implementation

Explain the students that Control structures are a set of instructions that controls the flow of instructions in a program. It is a programming tool that determines the order of execution of the statements in any programming language. Also, explain:

- Sequential Flow
- Selection Flow
- Repetition Flow

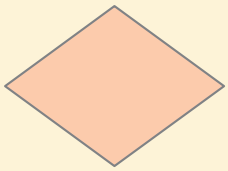
Tell the students that an algorithm is a step-by-step approach to identify and solve a problem in a finite time. It is used in a problem-solving phase of any programming task and helps in defining the clear instructions in sequence.

Also, define the following:

- Writing an Algorithm
- Advantages of Algorithm
- Disadvantages of Algorithm

Share with the students that a flowchart is a graphical representation of an algorithm. It makes use of symbols which are connected through arrows to show the direction of flow of information.

SYMBOL NAMES	SYMBOLS	PURPOSE
Oval		Used to start and stop a flowchart.
Parallelogram		Used to take input and display output.
Rectangle		Used to perform assignment, mathematical and processing operations.

Diamond		Used for decision making in case of branching or looping.
Arrow in any direction		Used to show the direction of flow of information in a flowchart.

Also, explain the following:

- Drawing a Flowchart
- Advantages of Flowchart
- Disadvantages of Flowchart

Explain the difference between Algorithm and Flowchart to the students in detail:

Algorithm	Flowchart
It is a step-by-step textual approach to solve a problem.	It is step-by-step visual/graphical approach to solve a problem.
It is a Pseudocode (false code) of a program.	It is a graphical representation of a program.
Difficult to represent branching and looping.	Easily represents branching and looping through symbols.
Easy to find errors.	Difficult to find errors.
Can be used for simple, complex or long processes.	Advisable to use only for simple processes.

Tell the students what is CodeCombat and explain the following in detail with detailed steps:

- Using CodeCombat

Explain the following to the students:

- What is Python?
- Important Features of Python
- Role of Python in AI
- Importance uses of Python
- Installing Python
- Working in Python
- Python Character Set
- Statements in Python
- Tokens
- Operator Precedence
- Comments in Python
- The print( ) Function
- The input( ) Function
- Errors in Python
- Control Statements
- Sequential Statements
- Selection Statements
- Iterative Statements
- Lists in Python

Ask the student to solve the exercise given on page number 286 as **AI Reboot**.

Ask the students to solve the task given on pages number 265, 266, 278, 287, 292, 293 and 311 as **AI Task**.

Extension

Ask the students some oral questions based on this chapter.

Q. What is algorithm?

Q. What is Flowchart?

Q. What is Python?

Q. What are the features of Python?

Q. Define the following:

- Role of Python in AI
- Working in Python
- Tokens
- The print( ) Function
- Control Statements
- Iterative Statements
- Importance uses of Python
- Python Character Set
- Operator Precedence
- The input( ) Function
- Sequential Statements
- Lists in Python
- SequInstalling Python
- Statements in Python
- Comments in Python
- Errors in Python
- Selection Statements

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 316 to 329 in the main course book as **AI Quiz**, **Exercise** and **Unsolved Questions**.

Take the students to the computer lab and let them practice the activity given in **AI Lab** section on Pages 329 and 330 in the main course book. This will enhance the ability of the students and serve as a Subject Enrichment activity.

Suggested Activity

Ask the students to create simple programs in Python using the features, tokens, variables and keywords.