Strand 1 FOUNDATION OF PRETECHNICAL STUDIES.

1.1-Introduction to Pretechnical studies

Pretechnical studies is a series of learning areas written to provide practical experiences that support the acquisition of skills in technical areas derived from computer science and business studies.

Components of Pretechnical studies.

Pretechnical studies is a technical learning area comprising of:

Pretechnical studies – a learning area that involves acquiring practical skills and experience in technical area.

Computer science the study of computers and how computer technology can be used to solve problems.

Business study-involves study of activities that involves production, distribution and consumption of goods and services aimed at making profits.

The role of Pretechnical studies in day today life.

- It gives learners the skills they need to think critically and solve problems as well as preparing them for a technical & digital future.
- Facilitates development of appropriate skills and knowledge gained from the learning areas such as computer science and business studies.
- Offers a wide range of careers in Pretechnical area such as in safety and material handling, in computer science such as programmers, software engineering and in business studies such as accountant, traders, manager, bankers and shopkeeper.
- Pretechnical studies promotes independence and self-learning through various skills enhancing chances of creating employment opportunities and self-employment in individual.
- It equips learners with skills to use when observing personal safety and safety in working environment.

1.2 - Safety in the work environment.

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What is safety?

Safety is a situation where one avoids causing harm, discomfort or sickness to self and to others when carrying out the daily activities.

***Examples of safety measures include**:*

Wearing face mask to prevent spreading of airborne diseases or breathing in dirty air.

Buckling a safety belt while in a vehicle to avoid falling off the seat in case of emergency brakes.

Wearing hand gloves when working to avoid injury and dirt to the hands when working.

Wearing gum boots to protect the feet from injury when working in areas with mud or sharp objects.

Wearing an overall to guard against soiling clothes.

Potential safety threats in a work environment.

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Potential safety threats in work environment can either be physical or online.

Physical threats at workplaces.

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Physical safety threats include:

Sharp edged tools and objects that can easily cut or poke someone.
Disarranged rooms where one can easily tumble and fall.

Naked electric wires that can easily cause electric shock.

Poorly lit rooms where one can easily know oneself against objects.

Poorly stored items on the shelves where they can easily fall off and hit someone.
Working without protective gear where one can easily be hurt or injured.

Rooms with wet slippery floors where one can easily slip and fall.

Online threats at a workplace.

- Every online user should ensure they stay safe online by protecting themselves and others from online threats.
- ***Examples of online threats at work place include:***

Malware/virus attack.
Hacking.

Data theft.

Cyberbullying.

Friend requests from unknown people. Phishing attacks.

Ransomware-attempts to encrypt data and calling for ransom to release it or unlock code

Online safety rules and regulations in the work environment.

- **Online safety** is keeping safe from possible threats that a computer user may experience while engaging in activities through the internet.
- It includes:
- Protecting and managing personal information.
- Avoiding harmful or illegal content.

To avoid online fraud, always buy online items from secure and trusted sites. Also, watch out for scams that come in form of messages and emails.

Do not accept friend requests from strangers. Some strangers are hackers who might access your personal information and even take over your accounts.

Phishing is an online fraud system used to steal private data such as login usernames and passwords.

Use strong passwords that cannot be crashed easily in case your password is compromised. Consider changing it right away.

Always back up your data and keep your computer security updated.

Physical threats to digital devices.

Physical threats to a computer include:

- Fluids such as water, milk and juice that can damage different parts of the devices.
- Theft.
- Damage caused by natural disasters, fire and impact of falls.
- Corrosion caused by excessive humidity and dampness.
- Exposed cables in the computer room.
- Hardware failure

❍ Ways of mitigating/reducing physical threats to digital devices.

To prevent physical threats, the following should be done.

Do not carry water into the computer room or near the computer.

Do not use old and loose power extension cables in a computer room. They produce sparks that can cause fire in the computer room.

Replace loose power extension cables because they may lead to unstable power supply. Use voltage controllers to curb unstable power supply in the computer room.

Equip computer rooms with fire extinguishers that do not use water, the computer room can be fit with automatic fire detectors that will detect fire or smoke and alert the personnel in charge for quick action.

Tuck computer cables in trunks or carefully lay them down under the desks in order to prevent falls in the computer room.

Place computers on strong furniture to prevent them from falling. Restrict access to computer rooms.

Secure the computer room with strong windows and doors to control theft of computers. To increase the security level, you can install CCTV cameras and also employ security personnel.

Use computer cable locks to control theft in the computer room.
Use dehumidifiers to control excess humidity and dampness.

Ensure there is enough ventilation or free circulation of air in the computer room.

Fit window curtains and air conditioners in the computer room to control and filter dust particles from entering the room.

Cover computers with dust covers when they are not in use.

Ideas and practices on how to personal and sensitive data from the public when online:

To keep personal and sensitive data from the public when online, the following can be done:

Protect and manage personal information.

Do not accept friend requests from strangers.
Avoiding harmful or illegal content.

Buy online items from secure and trusted sites.
Installation of antivirus software.

Backing up data.

Use of strong passwords.

Log out from your online accounts after using public internet to browse. Do not communicate with strangers online.

Safety Rules and Regulations at Work.

- Safety rules and regulations exist in all workplaces. They are principles that govern the actions and procedures to keep the works property and the environment safe.
- Some of the general safety rules and regulations include:

To ensure that you know how to safely perform the task.

To ensure you know the hazards of the task and how to protect yourself.
To wear the required personal protective equipment necessary for the task.
To always work clear of suspended loads.

To always keep your mind and eyes on the task at hand. To obey all warning signs and barricades.

To inspect all tools and equipment to ensure they are not defective before using them.

Do not perform a task under unsafe conditions and report any unsafe tools, equipment or hazardous conditions.

All chemicals' containers should be well labelled and covered.
Maintain good housekeeping at workplace all the time.

1.3 – Computer Concepts.

What is a computer?

- ***A computer is an electronic device that process or converts data into information.***
- A computer receives, stores, organizes and processes data into information.
- The word computer came from Latin word '***computare'*** which means to ***calculate***.
- A computer uses programs that are sets of instructions which a computer follows to perform tasks.

What is Data?

Data refers to raw facts such as numbers, symbols, images and letters that are not processed and have no meaning to the user.

Data is plural while in singular it is datum.

Data is not meaningful to the user until it is processed.

Examples of Data include:

- ✓ *Texts.*
- ✓ *Images.*
- ✓ *Sound.*
- ✓ *Videos.*

What is information?

Information refers to processed data that is meaningful to the user. Information is meaningful to the user.

List the examples of computers used today.

✓ The following are examples of computers:

Notebook.

Desktop.

Laptop.

Tablets.

PDA (Personal Digital Assistant)

Electronic calculators.

ATM Machines.

Washing machines.

Microwaves.

Server.

IPad.

MacBook.

Smartphone.

Smart watch.

Workstations.

Characteristics of Computers.

- **Speed**- *computers perform tasks faster compared to human beings.*

- **Accuracy**- *computers performs tasks without any errors if the correct data is entered.*

- **Versatility** *–versatility is the ability of a computer to perform different tasks. A computer can be applied in education, agriculture, military and medical fields.*

- **Reliability**- *Computers are reliable because they give consistent output results for similar tasks.*

- **Diligence** *–a computer can perform millions of tasks without getting tired. It does not get fatigue or loss concentration like human beings.*

- **Storage** - *computers have storage facilities or memory for storing data and information either temporarily or permanently which can be retrieved to be used later.*

- **Automation**-*a computer is an automatic machine. It starts a task from beginning to end without requiring human assistance.*

- **No logical decision**-*a computer cannot work on its own without being instructed by a user hence it is not intelligent enough on its own.*

Classification of Computers

Computers are classified according to some criteria.

- We can classify computer by looking at the following:
  - ***Functionality.***
  - ***Purpose.***
  - ***Size.***

☞ **Criteria used to classify computers.**

By functionality or data handling	By size	By purpose
Analogue computers	*Micro computers*	*General purpose computers*
Digital computers	*Mini computers*	*Special purpose computers.*
Hybrid computers	*Mainframe computers*	
	Super computers	

Classifying Computers According to functionality/data handling

Computers are classified as ***analogue***, ***digital*** or ***hybrid*** based on functionality/data handling. Data handling is the form in which data is represented in a computer.

- **Analogue computers.**
  - ✓ They were the first computers to be developed and used in measuring quantities such as temperatures, pressure, car speed and voltage.
  - ✓ They accepted data directly without converting it.
  - ✓ Examples of analogue computers include: speedometer and mercury thermometer.

- **Digital computers.**
  - ✓ They included modern computers like laptops, tablets, desktops and smartphones.
  - ✓ They are designed to perform calculations and logic operations at high speed.
  - ✓ They accept the raw data as input and process it with programs stored in its memory to produce the desired output.

A laptop

A Tablet

A Desktop

A Smartphone

- **Hybrid computers.**

  - ✓ They combined best features of the analogue computers such as speed and those of the digital computers such as internal memory.
  - ✓ They are used in specialized applications where both analogue signals and convert them into digital form before processing.
  - ✓ Examples of hybrid computers are fuel pump and the analogue blood pressure monitoring device.

Classifying Computers According to Purpose

1. General purpose computers

- They are most common computers that can perform most common tasks such as word processing, calculations, draw, play music and send electronic mails.
- General purpose computers are mostly used in schools, hotels, hospitals and at homes.

2. Special purpose computers.

- They are computers designed to carry out specific tasks only.
- They are mainly used in manufacturing industries, traffic control systems, weather forecasting, robotic systems, satellites and ATM machines.

Classifying Computers According to Purpose

1. Supercomputer.

- It is the biggest.
- It is the most expensive.
- It is the fastest and most powerful computer for big data processing.
- It is able to process many instructions in a second.
- It is mainly used in application requiring complex mathematical calculations such as in-flight simulation in aerospace, in weather forecasting and in satellite launching.

2. Mainframe computers.

- They are the largest and most expensive after super computers.
- They have a higher processing power which can handle thousands of connected peripheral devices or users at the same time.
- They store large amount of data, instructions and information.
- Most government institutions use mainframe computers to store data, calculate interest rates and customer balances.

3. Mini computers.

- They are smaller, less powerful and less expensive than main frame and super computers.
- They are more expensive and powerful than personal computers.

- They provide a centralized location for data, information and programs.
- They are also used to perform calculations and process business transactions.

4. Microcomputers.

- They are the least powerful, smallest and cheapest computers.
- They are also called personal computers. They are called microcomputers because their processing device is called a microprocessor.
- They are designed to be used by one person at a time.
- They are used in offices, schools, businesses, media houses or to keep records, prepare lesson plans and to browse.

Strand 2- COMMUNICATION

2.1 Fundamentals of communication.

Meaning of Communication.

Communication is the process of sharing information through a channel from the sender to the receiver.

Importance of communication in the work environment.

Good communication ensures making decision is easier.

Communication helps to build positive relationships, teamwork and trust at workplaces. Good communication helps to achieve greater goals.

Communication enables managers' shares goals with shareholders both inside and outside the organisation. It gives managers permission to stimulate behaviour changes in employees and suppliers and to inspire loyalty from the employees and customers.

It allows managers to convince employees and unions to abandon counterproductive practices, managers persuade leaders to provide financing and it permits managers to calm angry customers and impress new ones.

Preventing misunderstanding and conflicts.
Improving customer services.

Meeting goals and earning success.
Promoting creativity and innovation.

Advancing individual career prospects.

ICT Tools in Communication.

- **Emails**-*used to exchange information over the internet to other individuals.*
- **Mobile phones**- *allows calling and messaging in communication.*
- **Computers** -*computer provide various communication channels such as emailing, video calling etc.*

- **Videos and web conferencing**- *Video conferencing has a focus on face-to-face communication. Web conferencing has a focus on interaction and collaboration such as document sharing.*

- **Social networking** - *use of dedicated websites and applications to interact with other users.*

- Online collaboration - *using the internet and online tools to collaborate.*

- **Softwares like word processor** *are used to design letters and memos that are used to pass information in business.*

- **Social media** is used to give immediate response to customer needs.

Benefits and challenges of the internet.

Benefits of the Internet.