



GOVERNMENT DEGREE COLLEGE (MEN)

ACCREDITED BY NAAC WITH B++ (CGPA 2.90)

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ICT BASED LESSON PLAN

Date and Time (duration)	07.11.2023
Class:	III B.SC MPCS
No. of students attended	26
Name of the Class Teacher	R.Ravi Kumar, Lecturer in Physics,GDC(M),Srikakulam
Title:	Vapour compression refrigeration system
Objectives	The objectives of a vapour compression refrigeration system are to efficiently transfer heat from the refrigerated space, enabling precise temperature control and effective cooling. It emphasizes energy efficiency, utilizing environmentally responsible refrigerants and sustainable practices. The system aims for reliability, adaptability to diverse needs, cost-effectiveness, and a reduced environmental footprint, prioritizing safety and compliance with regulations. Ultimately, it strives to provide efficient, tailored cooling solutions across different applications, ensuring comfort, preservation, and industrial processes are optimally managed.
Materials used	1.Computer with projector 2.Internet access 3. Access videos from YouTube 4.Whiteboard and markers
Introduction (5 minutes) Begin with a captivating video or images.	1. What is Refrigeration? 2. How does Your Fridge Work? 3. What is the Role of Heat in Refrigeration? 4. Can You Name the Key Components? 5. Environmental Impact of Refrigerants? 6.Can you name some everyday applications or industries that heavily rely on vapour compression refrigeration systems? 7.What safety precautions do you think are important when dealing with refrigeration systems? Why are they necessary?
	Students were visualized the YouTube video and principle, working of Vapor compression refrigeration system

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**Virtual Insect Exploration
(10 minutes)**

<https://www.youtube.com/watch?v=PjcdqAkP0UA>
https://www.youtube.com/watch?v=-Wj_MO4BqtA
https://www.youtube.com/watch?v=c9_ryuPCTRA

**Presentation and Discussion
(20 minutes)**

The vapour compression refrigeration system is a common method used for refrigeration and air conditioning.

Basics of Refrigeration:

Explanation of the need for refrigeration.
Temperature control, preservation, and comfort as primary objectives.

Components of a Vapour Compression Refrigeration System

- Overview of the main components: compressor, condenser, expansion valve, and evaporator.
- Explain the function and purpose of each component.

Compressor

- Detailed explanation of the compressor's role in the system.
- Mention the types of compressors (e.g., reciprocating, rotary, screw) and their applications.

Condenser

- Detailed explanation of the condenser's function.
- Discuss types of condensers (e.g., air-cooled, water-cooled) and their efficiency.

Expansion Valve

- Explanation of the expansion valve's role in regulating refrigerant flow.
- Discuss the types of expansion valves and their operation.

Evaporator

- Detailed explanation of the evaporator's function.
- Discuss types of evaporators (e.g., flooded, dry expansion) and their applications.

Refrigerant

Explanation of the importance of refrigerants in the system.

Discuss types of refrigerants and their environmental impact (mention transition to environmentally friendly refrigerants)

Working Cycle of a Vapour Compression Refrigeration System

- Diagram and explanation of the basic vapour compression cycle (e.g., pressure-enthalpy diagram)
- Discuss the four main processes: compression, condensation, expansion, and evaporation.

	<p>Energy Efficiency and Improvements</p> <ul style="list-style-type: none"> • Discuss energy efficiency considerations in a vapour compression system. • Mention advancements and innovations to improve efficiency (e.g., variable speed compressors, heat recovery). <p>Applications</p> <ul style="list-style-type: none"> • Discuss various applications of vapour compression refrigeration systems (e.g., household refrigeration, air conditioning, industrial processes). <p>Advantages and Disadvantages</p> <ul style="list-style-type: none"> • Present the advantages and disadvantages of using a vapour compression refrigeration system.
Conclusion (5 minutes)	<p>The vapour compression refrigeration system stands as a cornerstone of modern cooling technology, exemplifying efficiency and reliability. Its essential components - compressor, condenser, expansion valve, and evaporator - work in harmony to create a continuous refrigeration cycle. The careful selection of refrigerants is vital, considering both efficiency and environmental impact, steering the industry towards eco-friendly options. This versatile system finds applications in diverse sectors, from household refrigeration to industrial processes. Ongoing efforts are directed at enhancing energy efficiency, ensuring a sustainable future by minimizing the ecological footprint. As we move forward, the industry will strive for a delicate balance between providing optimum comfort to users and adopting eco-conscious practices, requiring continuous adaptation and innovation to meet evolving needs.</p>



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