



G.Pullaiah College of Engineering and Technology

(Autonomous)

(Approved by AICTE, New Delhi | NAAC Accreditation with 'A' Grade |

Accredited by NBA (CSE, ECE & EEE) | Affiliated to JNTUA)

Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

DATE: 22-10-2021

To

The Principal,
GPCET,
Kurnool.

Sir,

Sub: Approval of ADD-ON course for II ME, III ME & IV ME Students-Regd

The department of ME requests you to accept the proposal for conducting ADD-ON Course on "Cryogenic Hydrogen Technology" for the odd semester of II, III & IV year ME students scheduled for the duration of 42 hours. Kindly accept the proposal.

Thanking you sir,

Yours Sincerely

HOD-ME

PRINCIPAL

G.Pullaiah College of Engg. & Tech.
Nandikotkur Road, VENKAYAPALLI
KURNOOL-518 452 (A.P)



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Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

Department Circular –ADD-ON Course

DATE: 23-10-2021

The II year, III year & IV year-I semester ME Students are informed to enroll their names for ADD-ON Course on “**Cryogenic Hydrogen Technology**” with their respective class-in-charges on or before 27-10-2022. The course commences from 29th October and the duration of the course is for 42 hours. The course is conducted from 4 pm to 5 pm regularly.

Bus facility is made available soon after the class work.

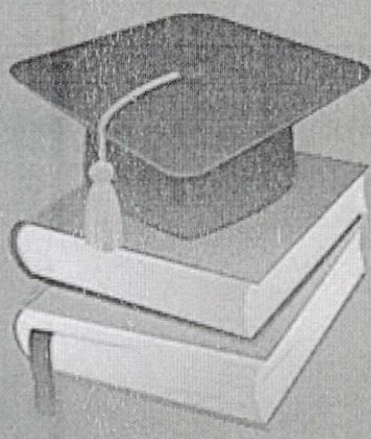
HOD-ME



**G. PULLAIAH COLLEGE OF
ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)**

Department Of Mechanical Engineering

ADD ON COURSE



Topic : Cryogenic Hydrogen Technology

Target audience : II and III Year Students

Total Course Duration : 42 hrs

**Selection Procedure : Registration on First
come First serve basis**

FREE

**Register
Now**

Date of commencement of the course : 29 Oct , 2021.

End of Course : 03 Jan, 2022.

Exam Date: 05 Jan,2022.

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**SYLLABUS FOR ADD-ON COURSE ON CRYOGENIC HYDROGEN
TECHNOLOGY**

DAY	TOPICS
1	Cryogenic Hydrogen Storage
2	Hydrogen Liquefaction
3	Transportation of Cryogenic Hydrogen
4	Cryogenic Hydrogen Infrastructure
5	Cryogenic Hydrogen Production
6	Cryogenic Hydrogen Handling and Transfer
7	Thermal Management
8	Materials for Cryogenic Hydrogen Systems
9	Cryogenic Hydrogen Safety
10	Cryogenic Hydrogen Applications
11	Economic and Environmental Considerations
12	Research and Innovation in Cryogenic Hydrogen

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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY: KURNOOL (Autonomous)

Department of Mechanical Engineering

The following is the list of the students who have registered Add on Course on “Cryogenic Hydrogen Technology”

S.No	ROLL NO	Name of the Candidate
1	19AT1A0301	SYED ABBAS
2	19AT1A0302	K. ABHI RAM MANIKANTA YADHAV
3	19AT1A0303	SHAIK AFROZ BASHA
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G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOG
DEPARTMENT OF MECHANICAL ENGINEERING
ADDON COURSE SCHEDULE

Date: 29/10/2021

II& III YEAR – I Semester		
Course	Faculty	Duration
Cryogenic Hydrogen Storage	A. V. KRISHNA CHAITANYA	3 hours
Hydrogen Liquefaction	A. V. KRISHNA CHAITANYA	3 hours
Transportation of Cryogenic Hydrogen	A. V. KRISHNA CHAITANYA	3 hours
Cryogenic Hydrogen Infrastructure	A. V. KRISHNA CHAITANYA	2 hours
Cryogenic Hydrogen Production	A. V. KRISHNA CHAITANYA	2 hours
Cryogenic Hydrogen Handling and Transfer	M.NAGARAJU	3 hours
Thermal Management	M.NAGARAJU	3 hours
Materials for Cryogenic Hydrogen Systems	M.NAGARAJU	2 hours
Cryogenic Hydrogen Safety	M.NAGARAJU	2 hours
Cryogenic Hydrogen Applications	M.SEKHAR	3 hours
Economic and Environmental Considerations	M.SEKHAR	2 hours
Research and Innovation in Cryogenic Hydrogen	M.SEKHAR	2 hours

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G. PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

II, III & IV B. Tech I SEM Objective Paper – Assessment

Branch: MECHANICAL ENGINEERING

Sub: Cryogenic Hydrogen Technology

Date: 05/01/2022

Time: 30 min

Max.Marks:25

Roll No:

Invigilator signature:

I. MULTIPLE CHOICE QUESTIONS

1. What is the primary advantage of using cryogenic hydrogen technology? []
a) Lower energy efficiency b) Reduced storage volume c) Increased safety risks d) Higher production costs
2. Which temperature range is typically associated with cryogenic hydrogen storage? []
a) Below 0°C b) Between 0°C and 100°C c) Below -150°C d) Between 100°C and 200°C
3. What is the primary challenge of storing hydrogen at cryogenic temperatures? []
a) Reduced efficiency b) Material embrittlement c) Increased pressure requirements d) Decreased safety risks
4. Which of the materials is commonly used for cryogenic hydrogen storage tanks? []
a) Aluminum b) Copper c) Stainless steel d) Plastic
5. What is the primary application of cryogenic hydrogen technology? []
a) Water treatment b) Space exploration c) Food processing d) Automobile manufacturing
6. What is the benefit of using cryogenic hydrogen technology in space exploration? []
a) Reduced payload weight b) Increased atmospheric pressure c) Lower production costs d) Longer mission durations
7. What is the main challenge of using cryogenic hydrogen in automotive applications? []
a) Limited availability b) High production costs c) Increased refueling time d) Reduced vehicle range
8. Which of the following is NOT a common method of cryogenic hydrogen production? []
a) Steam reforming b) Electrolysis c) Cryogenic distillation d) Biomass conversion
9. What is the primary advantage of using cryogenic hydrogen in fuel cell applications? []
a) Lower efficiency b) Reduced emissions c) Higher costs d) Limited availability
10. Which of the following is a characteristic of cryogenic hydrogen storage systems? []
a) Low energy density b) High-pressure requirements c) Reduced safety risks d) Minimal insulation requirements

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11. What is the primary challenge of using cryogenic hydrogen in transportation? []
a) Limited refueling infrastructure b) High energy density c) Lower efficiency d) Reduced emissions
12. Which of the following is safety consideration in cryogenic hydrogen storage? []
a) Increased fire risk b) Material embrittlement c) Thermal insulation d) Limited pressure requirements
13. What is the primary benefit of using cryogenic hydrogen in industrial processes? []
a) Increased environmental impact b) Enhanced safety c) Higher production costs d) Reduced energy efficiency
14. Which of the following is a component of a cryogenic hydrogen storage system? []
a) Insulation b) Pressure relief valves c) Combustion chamber d) Safety sensors
15. What is the challenge of using cryogenic hydrogen in residential applications? []
a) Limited availability b) Increased safety risks c) Higher production costs d) Reduced energy efficiency
16. What is the primary benefit of using cryogenic hydrogen in power generation? []
a) Reduced emissions b) Increased energy efficiency c) Lower production costs d) Limited refueling infrastructure
17. Which of the following is a method of cryogenic hydrogen transportation? []
a) Pipelines b) Tanker trucks c) Railcars d) All of the above
18. What is the primary challenge of using cryogenic hydrogen in aviation? []
a) Limited payload capacity b) Higher production costs c) Reduced safety risks d) Increased refueling time
19. What is the primary benefit of using cryogenic hydrogen in maritime applications? []
a) Increased fuel efficiency b) Reduced emissions c) Lower production costs d) Minimal refueling infrastructure
20. Which of the following is a common application of cryogenic hydrogen technology? []
a) Energy storage b) Food preservation c) Rocket propulsion d) Medical imaging
21. What is the primary challenge of using cryogenic hydrogen in cold climates? []
a) Decreased safety risks b) Material embrittlement c) Increased energy efficiency d) Reduced pressure requirements
22. What is the benefit of using cryogenic hydrogen in grid-scale energy storage? []

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- a) Limited environmental impact
- b) Increased energy efficiency
- c) Reduced production costs
- d) Enhanced grid stability

23. What is the challenge of using cryogenic hydrogen in microgrid applications? []

- a) Limited scalability
- b) Increased safety risks
- c) Higher production costs
- d) Reduced environmental impact

24. What is the benefit of using cryogenic hydrogen in remote power applications? []

- a) Reduced emissions
- b) Increased energy efficiency
- c) Lower production costs
- d) Enhanced reliability

25. Which of the following is a common method of cryogenic hydrogen production? []

- a) Electrolysis
- b) Steam reforming
- c) Biomass conversion
- d) Natural gas reforming

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