



GOVERNMENT DEGREE COLLEGE

Tekkali, Srikakulam Dist. A.P.

Institute Reaccredited by NAAC at 'B' Level

Department of Physics

CERTIFICATE COURSE

on

Air Conditioner Installation & Services

28-01-2026 to 05-03-2026



Coordinators : Ch.Rambabu HOD, Lecturer in Physics

Smt. T. Kasiratnam Lecturer in Physics

PRINCIPAL : Dr. T.GOVINDAMMA

Dept. in charge

Principal

PRINCIPAL

Govt. Degree College
TEKKALI-532 203

28/1/26
Date:24-Jan-2026.

To,
The Principal,
Government Degree College,
Tekkali.

From,
The Department of Physics,
Government Degree College,
Tekkali.

Respected Madam,

Subject: Requisition for grant permission for conducting a certificate course on
"Air conditioner installation and services" from Department of Physics.

We are Department of Physics, Government Degree College, Tekkali willing to conducting a certificate course on the topic entitled with **"Air conditioner installation and services"** from **28-Jan-2026 to 28-Feb-26** for B.Sc ,B.Com &B.A group students. We would like to request permission on your good office to conduct a certificate course through offline. The said course is most lead to student job opportunities in daily lives.

Hoping for merit on this request.

Thanking you madam,



Very truly your's,

Department of Physics.



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DEPARTMENT RESOLUTION FOR CONDUCTING CERTIFICATE COURSE

A meeting of the Department of **Physics** was held on **26-01-2026** at **11am** in **staff room** under the chairmanship of **[Head of the Department Ch.Rambabu]**.

The following members were present:

1. T.Kasiratnam, lecturer in Physics
2. N.Ramanamurthy, lectutrer in Physics

Agenda:

To discuss and approve the conduct of a Certificate Course on **Air Conditioner Installation & Services**

Resolution:

After detailed discussion, the department unanimously resolved to introduce and conduct a Certificate Course titled "**Air Conditioner Installation & Services**

" for the benefit of students. The course aims to enhance knowledge and practical skills in plant products.

The key details of the course are as follows:

- **Duration:** [e.g., 4–6 weeks / 30 hours]
- **Eligibility:** Faculty & Students from any stream
- **Intake Capacity:** 30
- **Course Coordinator:** **Ch.Rambabu , T.Kasiratnam**
- **Mode of Delivery:** Offline/Online/Blended
- **Assessment Method:** Assignments/Tests/Project

The department also resolved to:

- Prepare a detailed syllabus and course schedule.
- Utilize available departmental infrastructure and resources.
- Invite subject experts, if necessary, for specialized sessions.
- Issue certificates to participants upon successful completion of the course.

The resolution was passed with the approval of all members present.

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- 1) **Qualifications** : Any Degree
- 2) **Who can apply** : Faculty from any stream, Students from any stream,
- 3) **Number of seats** : 30
- 4) **Medium** : Telugu & English
- 5) **Course duration** : 30 hrs.
- 6) **Instructional hrs. (teaching)** : 1hr per day
- 7) **Instructional hrs timings** : 4pm to 5pm
- 8) **Mode of instructions** : OFFLINE
- 9) **Final assessment** : exam
- 11) **Instructors** : Ch.Rambabu, M.Sc. lecturer in Physics,
T.Kasirtnam, M.Sc., AP.SET lecturer in Physics
N.Ramanamurty M.Sc., AP.SET Lecturer in Physics
P.Mohana Rao Electrical and AC Technician Samsu
- 12) **Fee** : free of cost
- 13) **Registration** : Contact dept. of Physics

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Objectives of the Programme

1. Air conditioner certificate courses aim to equip trainees with core skills to install, maintain, and troubleshoot HVAC systems, including residential split, package, and sometimes commercial units
2. Mastering refrigeration cycles, gas charging, electrical troubleshooting, and environmental safety protocols to ensure energy efficiency and high-quality indoor air.

Outcomes

- Technical Skills and Competencies
- Installation: Ability to install window, split, and package air conditioning units according to manufacturer specifications, including site selection, mounting, connecting copper tubing, and electrical wiring.
- Maintenance & Service: Proficiency in routine maintenance, including cleaning coils, checking filters, lubrication, and system inspection to improve energy efficiency.
- Troubleshooting & Repair: Skills to diagnose and fix common AC problems such as poor cooling, unusual noise, refrigerant leaks, compressor failure, and water leaks.

Knowledge based outcome

- Modern HVAC Techniques: Familiarity with modern technology, including inverter AC systems, variable refrigerant flow (VRF) systems, and environmentally friendly refrigerants.
- Career and Employability Outcomes
- Job Readiness: Graduates are prepared for roles such as AC Technician, HVAC Technician, Service Mechanic, or Installer.
- Entrepreneurship: Skills to start independent service businesses or consultancy in the HVAC sector.
- Opportunities for employment in diverse sectors such as residential construction, commercial facilities, food storage/retail chains, and the automotive industry.

Compact powder formulation: binding agents like arrowroot or beeswax; texture and application techniques.

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GOVERNMENT DEGREE COLLEGE, TEKKALI

(Reaccredited with NAAC 'B' Grade)



Department of Physics

Certificate Course

On

Air Conditioner, Installation & Service

Syllabus:

Duration: 30 Hours (approx. 15 Theory + 15 Practical)

Outcomes:

- To Evaluate performance parameters like Coefficient of Performance (COP)
- To analyze the Vapor Compression Refrigeration (VCR) and Vapor Absorption systems.
- To Understand the working of modern inverter ACs, Variable Refrigerant Flow (VRF/VRV) systems, and IoT-based troubleshooting.
- To Conduct vacuuming, nitrogen pressure testing, and charging systems with environmentally safe refrigerants (e.g., R-134a, R-32).
- To Identifying errors through digital codes or manual testing of components like the hermetic compressor, relay, and capacitors.
- To Enhance Ability to interact with clients, estimate project costs, and manage a service-based business.

Unit 1: AC Fundamentals and Types:

10 hours

Focus: From Classroom Physics to Industrial Machinery The Physics of Cooling: Review of the Second Law of Thermodynamics, Latent vs. Sensible heat, and the Vapor Compression Cycle (Compression, Condensation, Expansion, Evaporation). System Components: Physics of Heat Exchangers (Conduction/Convection), Compressor mechanics (Reciprocating vs. Rotary/Inverter), and Metering devices, Air Conditioner Classification: Unitary Systems: Window ACs and Portable units. Split Systems: High-wall, Cassette, and Floor-standing units. Advanced Systems: Multi-split, VRF (Variable Refrigerant Flow), and Centralized plants (Package units). Physics of Refrigerants: Thermodynamic properties of R-32, R-410A, and R-290; Pressure-Temperature (P-T) relationships and environmental impact (GWP/ODP).

Unit 2: Installation Techniques & Physics of Fluid Flow:

10 hours

Focus: Precision Engineering and Fluid Dynamics Site Survey & Heat Load Calculation: Using physics to determine Tonnage ($Q = mc\Delta T$); accounting for solar radiation, orientation, and occupancy. Installation Procedure: * Mechanical: Mounting plates, drilling (structure integrity), and gradient for condensate drainage. Copper Piping: Physics of brazing, flaring, and swaging; ensuring airtight seals. Evacuation & Dehydration: The importance of the Vacuum Pump; understanding partial pressure and removing non-condensable gases and moisture. Electrical Integration: Circuit analysis, wiring of indoor/outdoor units, and grounding (Safety Physics).

Unit 3: Maintenance, Diagnostics, and Sales:**10 hours**

Focus: Troubleshooting and Commercial Strategy Routine Servicing: Chemical cleaning of coils, filter maintenance, and the impact of dust on heat transfer efficiency. Fault Diagnostics: * Mechanical: Identifying gas leaks (Soap test/Electronic detectors) and capillary blockages. Electrical: Testing PCBs, sensors (Thermistors), and capacitors using multimeters. Gas Charging: The "Superheat" and "Subcooling" methods to ensure peak efficiency. The Sales Consultant Role: Translating technical data (ISEER, Star Ratings, Inverter benefits) into "Total Cost of Ownership" for customers.

Practical Lab Curriculum

Exercise	Practical Task	Physics Application
P1	Tubing Workshop.	Flaring, bending, and brazing of copper.
P2	Vacuum & Leak Test.	Using gauges to monitor pressure differentials.
P3	Gas Charging.	Using gauges to monitor pressure differentials.
P4	PCB Testing.	Tracing signals and checking sensor resistance.
P5	Installation Demo.	Full installation of a 1.5 Ton Split AC unit.



GOVERNMENT DEGREE COLLEGE, TEKKALI



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Organized by Department of Physics

Certificate Course inauguration

Air conditioner installation and services

28-01-2026

S.NO.	Name & Designation	Signature
1.	Dr. T. GOVINDAMMA	Govinda.
2.	Dr. B. Sateesh Kumar vice principal	Bomm
3.	V. Luke Paul IBAC Coordinator	V. L. H.
4.	A. Rambabu	A. _____
5.	Smt. Kari Ratnam. Teleti. Lect in physics	Kenn
6.		
7.	Dasari. Mohana Rao (Sanskrit)	Mohana
8.		
9.		
10.		



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28-01-2026

Students participated

S.NO.	Name & Group	Signature
1.	Ch. Bhavaniprasad [B.com Computers]	Ch. Bhavaniprasad
2.	M. Shivasankar [B. com Computers]	M. Shivasankar
3.	G. Ganesh [B. Com Computer] 2nd	G. Ganesh
4.	P. VASU [B. com Computers]	P. Vasu
5.	Dakshidan Behera [B.com Computer]	Dakshidan Behera
6.	GoPAAL Behera [B. com computer]	GoPAAL Behera
7.	N. Mounika [B.com (General)]	N. Mounika
8.	D. Mounika [B.com (com)]	D. Mounika
9.	D. Adeline [B.com (com)]	D. Adeline
10.	Ch. Meena [B.com (com)]	Ch. Meena
11.	S. Esvari [B.com (Gen)]	S. Esvari
12.	G. Ramya Sri [B.com (Gen)]	G. Ramya Sri
13.	G. Jhansi [B.com (Gen)]	G. Jhansi
14.	N. Sai Sindhuja [BSc physics]	N. Sai Sindhuja
15.	M. Sri [BSc physics]	M. Sri
16.	B. Mounika [BSc physics]	B. Mounika

ကုမ္ပဏီများက ကုမ္ပဏီတို့၏ နှစ်စဉ်
 ရင်းနှီးမြှုပ်နှံမှုများကို ကြည့်ရှုရန် အခွင့်အလမ်း
 ကုမ္ပဏီတို့၏ နှစ်စဉ် အသက်မွေးဝမ်းကျောင်း
 ကို ဖြည့်ဆည်းပေးရန် အခွင့်အလမ်း

ဥပဒေနှင့်အညီ နှစ်စဉ် အသက်မွေးဝမ်းကျောင်း
 အခွင့်အလမ်း ပြုလုပ်ပေးရန် အခွင့်အလမ်း
 ဝင်ရောက်ပါရန် ဥပဒေနှင့်အညီ

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ဥပဒေနှင့်အညီ



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Inauguration



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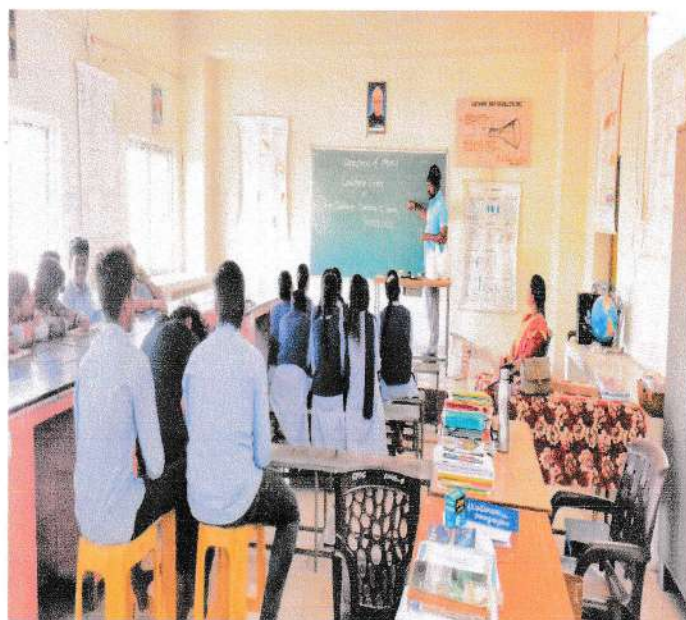


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Practical Work of Trouble Shooting gas Leakage in AC



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