MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Bachelor of Science (Honours) Physics - First Semester - 2026 Admissions Onwards - Inclusion of an additional course to the Multi Disciplinary Course basket and approval of the syllabus for the same - Approved - Orders issued.

ACA 16

No. 6797/ACA 16/2026/MGU Priyadarsini Hills,Dated: 09.07.2026

Read:-1. U.O. No. 5797/ACA16/2024/MGU, dated. 27.06.2024

2. Recommendations of the Chairperson, Board of Studies, Physics (UG).

3. Orders of the Vice Chancellor under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, dated. 08.07.2026.

ORDER

The syllabi of various Honours Under Graduate Programmes coming under the MGU-UGP (Honours) Regulations, 2024, have been approved vide paper read as (1) above and published on the website of the University.

The Board of Studies on Physics (U.G) has recommended vide paper read as (2) above, the inclusion of one more course, MG1MDCPHY101: Climate Physics, to the Multi Disciplinary Course basket in the First Semester of the Bachelor of Science (Honours) Physics programme from the Academic Year, 2026-2027. (Detailed syllabus for the course is attached as Annexure.)

Considering the urgency of the matter, the Vice Chancellor, in exercise of the powers of the Academic Council vested upon him under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, vide paper read as (3) above, to approve the said recommendations.

Orders are issued accordingly.

SIJI ANNA KURIEN

ASSISTANT REGISTRAR III

(ACADEMIC)

For REGISTRAR

Copy To

1. PS to VC
2. PA to Registrar/CE
3. Chairperson, Board of Studies, Physics (UG).
4. JR 2 (Admin)/ DR 2, AR 3 (Academic)
5. JR/DR/AR (Exam)
6. Tabulation/Academic Sections concerned
7. IT Cell 3 / OQPM - 1 Sections
8. AC C 1/ AC C 2 Sections
9. P.R.O. /IQAC /Records Sections.
10. Stock File/File Copy

File No: 57261/ACA16-2/2026/ACA 16

Forwarded / By Order

Section Officer

MahatmaGandhiUniversity

Kottayam

Programme	**B.Sc. (Hons) Physics**					
Course Name	**Climate Physics**					
Type of Course	**MDC**					
Course Code	**MG1MDCPHY101**					
Course Level	**100- 199**					
Course Summary	This course, covers the Earth's energy balance, atmospheric circulation, humidity, clouds, radiation, climate variability, and climate change at a level appropriate for undergraduate students from all disciplines.					
Semester	**1**	**Credits**			**3**	**Total Hours**
Course Details	**Learning Approach**	**Lecture**	**Tutorial**	**Practical**	**Others**	
		2	**0**	**1**	**0**	**60**
Pre-requisites, if any	**Nil**					

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No
1	Explain the components of the Earth's climate system and the basic physical principles governing weather and climate.	U	1,2
2	Explain the greenhouse effect, atmospheric and oceanic processes, and their role in regulating Earth's climate.	U	1,2
3	Explain the scientific evidence, causes and impacts of climate change.	U	1,2
4	Perform simple experiments and measurements related to climate variables and interpret the observed results.	S	1,2

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

COURSE CONTENT
Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs	CO No.
1	**Foundations of Physics and Earth's Climate**		**15**	
	1.1	**Climate and Earth System-** Weather vs climate, Components of the climate system, Atmosphere, oceans, land, ice, biosphere, Timescales in climate	3	1
	1.2	**Basic Physics Concepts-** Matter and energy, Heat and temperature, States of matter, Energy transfer: conduction, convection, radiation. Units and measurements	4	1
	1.3	**Solar Radiation and Earth's Energy Balance-** The Sun as Earth's energy source, Electromagnetic radiation, Reflection and absorption, Albedo, Earth's energy balance	5	2
	1.4	**Greenhouse effect-** Atmospheric composition, Greenhouse gases, Infrared absorption	3	2
2	**Climate Systems and Climate Change**		**15**	
	2.1	**Atmosphere and Weather Processes** Structure of the atmosphere, Air pressure and wind, Clouds and humidity, Water cycle, Atmospheric circulation	6	3
	2.2	**Oceans and Climate** Ocean heat storage, Ocean currents, El Niño and La Niña, Sea level rise	4	3
	2.3	**Climate Change Science** Evidence for climate change, Temperature records, Ice cores, Carbon cycle, Fossil fuels and emissions, Human influence on climate	5	3
3	**Practical**		**30**	
	3.1	Temperature measurement and diurnal variation		4

	3.2	Greenhouse effect demonstration		4
	3.3	Albedo experiment		4
	3.4	Land–water heating and cooling		4
	3.5	Evaporation rate experiment		4
	3.6	Homemade rain gauge		4
	3.7	Wind speed and direction measurement		4
	3.8	Cloud observation		4
	3.9	Household energy audit		4
	3.10	Climate data analysis using Excel		4
4	**Teacher Specific Content**			

Teaching and Learning Approach	**Classroom Procedure (Mode of transaction)** Lecture, Demonstration, Observation ,Interactive E-learning Group discussion

Assessment Types	**MODE OF ASSESSMENT** **A. Continuous Comprehensive Assessment (CCA)** **Theory:15 marks** **Formative Assessment** • Assignment • Seminar • Tutorial work **Summative Assessment** • MCQ exams **Practical:15marks** • Lab Involvement • Viva
	B. End Semester Evaluation (ESE) **Theory:35marks, Duration 1 hr** **MCQ Questions** • 1-mark questions (Answer any 15 from 17 questions) 1 X 15 = 15 • 2-mark questions (Answer any 10 from 12 questions) 2 X 10 = 20 **Practical: 35marks, Duration2hrs** • Lab Exam:30 marks • Record: 5 marks

Books for Reference

1. The Physics of Climate Change by Lawrence M. Krauss, Oxford University Press (2021)
2. Introduction to Modern Climate Change by Andrew E. Dessler, Cambridge University Press

Open Educational Resources

- **earthobservatory.nasa.gov – Climate, weather, remote sensing, and Earth system science.**
- **science.nasa.gov › climate-change– Introductory climate science, visualizations, and educational materials.**
- **www.noaa.gov › climate – Climate data, explanations, and teaching resources.**
- **https://wmo.int/ – Global weather and climate information.**
- **ipcc-data.org – Assessment reports and summaries of climate science.**
- **https://en.wikipedia.org/wiki/Earth_system_science**
- **https://en.wikipedia.org/w/index.php?title=Atmospheric_science**
- **https://en.wikipedia.org/wiki/Climate_change**
- **https://en.wikipedia.org/wiki/El_Ni%C3%B1o%E2%80%93Southern_Oscillation**
- **https://en.wikipedia.org/wiki/Electromagnetic_radiation**