



MAHATMA GANDHI UNIVERSITY, KERALA

**Abstract**

Bachelor of Science (Honours) Physics - Modifications to the Course Outcomes, Course Content and Question Paper Pattern for End Semester Evaluation - Approved - Orders Issued.

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**ACA 16**

No. 270/ACA 16/2025/MGU

Priyadarsini Hills, Dated: 13.01.2025

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

2. Minutes of the meeting of the Expert Committee on Physics (UG), held on 11.12.2024

3. Orders of the Vice Chancellor under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, dated. 09.01.2025.

**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 Expert Committee on Physics (UG), discussed the need to modify the Course Outcomes (CO), Course Content and question paper pattern for End Semester Evaluation of the courses, **MG2DSCPHY100: Modern Physics** and **MG2MDCPHY100: Observational Astronomy**, in the **Second Semester** of the Bachelor of Science (Honours) Physics programme and has submitted recommendations vide paper read as (2) above. **(Recommendations are attached as annexure.)**

Considering the emergency, sanction has been accorded by 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), to approve the above recommendations.

Hence, the Course Outcomes, Course Content and question paper pattern of the said courses in the second semester syllabus of the Bachelor of Science (Honours) Physics programme, stands modified to this extent.

Orders are issued accordingly.

SHAJI K G

ASSISTANT REGISTRAR III  
(ACADEMIC)  
For REGISTRAR

Copy To

1. PS to VC
2. PA to Registrar/CE
3. Convenor, Expert Committee, Physics (UG)
4. JR 2 (Admin)/ DR 2, AR 3 (Academic)
5. Tabulation/Academic Sections concerned
6. JR/DR/AR (Exam)
7. IT Cell 3 / OQPM - 1 Sections
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File No: 148283/ACA16-2/2024/ACA 16

Forwarded / By Order

Section Officer

## Annexure

### Semester 2

**Course Name : Modern Physics**

**Course Code : MG2DSCPHY100**

#### **COURSE OUTCOMES (CO)**

<b>CO No.</b>	<b>Expected Course Outcome (Modified)</b>	<b>Learning Domains (Modified)</b>	<b>PO No. (Modified)</b>	<b>Page Number</b>
2	To illustrate the dual nature of matter and radiation and to apply the uncertainty principle to microscopic systems.	No Change	No Change	28
3	To understand the concept of energy levels, spectra of atoms and atomic excitations.	No Change	No Change	
4	To understand the basic theory of LASERS	U	No Change	
5	To understand the basic concepts leading to quantum physics.	U,A	No Change	

#### **COURSE CONTENT**

##### **Content for Classroom Transaction (Units)**

<b>Module</b>	<b>Units</b>	<b>Course Description (Modified)</b>	<b>Hours (Modified)</b>	<b>CO No. (Modified)</b>	<b>Page Number</b>
1	1.1	No Change	2	No Change	29
	1.2	No Change	6	No Change	
	1.3	Mass Energy Relation	2	No Change	
	1.4	Removed			
2	2.1	No Change	10		
	2.1.1	No Change	6	No Change	
	2.1.2	No Change	4	No Change	

	2.1.3	Removed		
	2.2.1	De Broglie's Waves, Waves of probability, Electron microscope	No Change	No Change
	2.2.2	Heisenberg Uncertainty Principle (only verbal and mathematical statements required), Applying Uncertainty principle	4	No Change
	2.2.3	Removed		
3	3.1	Atomic Structure	No Change	
	3.1.1	Energy Levels and Spectra, origin of line spectra, Hydrogen spectrum, Atomic excitation: absorption and emission of energy by atoms	6	No Change
	3.1.2	LASER: basic properties, stimulated absorption, spontaneous and stimulated emissions, population inversion, (exclude practical lasers)	4	4
	3.1.3	Removed		
	3.2	No Change	8	
	3.2.2	No Change	2	No Change
	3.2.3	Schrodinger equation - Steady state form	No Change	No Change
	3.2.4	Particle in a box (upto energy eigen values and eigen functions)	2	No Change
	3.2.5	Removed		
				30

### MODE OF ASSESSMENT

#### B. END SEMESTER EVALUATION – THEORY (Modified)

Max.Marks: 50 Marks		Duration : 1 1/2 Hrs	
Type of Questions	Number of Questions to be Answered	Marks	Page Number
Short answer	10 out of 14	10 x 2 = 20	31
Short Essay	6 out of 8	6 x 5 = 30	
<b>Total</b>		<b>50 Marks</b>	

**Course Name : Observational Astronomy**

**Course Code : MG2MDCPHY100**

**COURSE OUTCOMES (CO)**

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No. (Modified)	Page Number
1	To comprehend historical perspectives, astronomical scales and basic concepts of positional astronomy	No Change	No Change	33

**COURSE CONTENT**

**Content for Classroom Transaction (Units)**

Module	Units	Course Description (Modified)	Hours (Modified)	CO No. (Modified)	Page Number
1	1.1	Introduction & Historical Perspective	7		34
	1.1.1	Introduction to astronomy, Astronomical distances - Astronomical unit, Light year, Parsec.	2	No Change	
	1.1.2	Historical Development of Astronomy - Ptolemaic Geocentric and Copernican Heliocentric models of the universe, Galileo and his observations.	No Change	1	
	1.2	Basics of Observational Astronomy	8		
	1.2.1	Celestial sphere, Equinox, Ecliptic, Seasons, Solar day Constellation - Orion, Ursa Major, Crux.	3	4	
	1.2.2	Astronomy in different bands of Electromagnetic spectrum, Types of telescopes - Optical Telescopes - Reflective Telescopes, Refractive telescopes - Hubble Space Telescope, James Webb Space Telescopes.	5	2	
2	2.1.2	Birth of stars, Nebula, Protostar, Main sequence star, Red giant, Death stages - White Dwarf, SuperNova - Neutron star - Black hole.	No Change	No Change	

	2.1.3	Galaxy - Classification of Galaxies - Elliptical, Spiral and Irregular. Milky Way.	No Change	No Change	
	2.2.1	Objects in Solar systems - Sun, Planets - Terrestrial & Jovian Planets, Asteroids, Comets, Meteors.	No Change	No Change	
	2.2.2	Eclipses - Solar Eclipses, Lunar Eclipses	No Change	No Change	
3		Practical	30	6	
	2	Locate any two brightest stars like Vega and Sirius in the night sky using Google Sky Map			35
	3	Virtual observatory exploration (basic ideas)			
	4	Hands on sessions on 'Stellarium' & Identification of Zodiac Constellations using Stellarium			
	5	Identifying and documenting night sky stars			
	6	Find and sketch the Orion Constellation. Name three stars in the belt.			
	7	Moon Phase calendar - Have students create a personalized moon phase calendar for a month. They can sketch the moon's appearance each night and note the date, enhancing their observational skills.			
	8	Astrophotography - Night Sky Photography			
	9	Telescope making workshop			
	10	Observe and Identify Sunspots			
	11				
	12				
	13				
	14				
	15				
		Removed			36

**MODE OF ASSESSMENT****B. END SEMESTER EVALUATION**  
(Modified)**Theory**

<b>Max.Marks: 35 Marks</b>		<b>Duration : 1 Hr</b>	
<b>MCQ</b>	<b>Number of Questions to be Answered</b>	<b>Marks</b>	<b>Page Number</b>
Part A	15	15 x 1 = 15	36
Part B	10	10 x 2 = 20	
<b>Total</b>		<b>35 Marks</b>	

**Practical**

<b>Max.Marks: 35 Marks</b>		<b>Duration : 2Hrs</b>	<b>Page Number</b>
Record	15 Marks	36	
Viva	20 Marks		