

5D01PHY:INTRODUCTION TO CLIMATE AND CLIMATE CHANGE SCIENCE

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|-----------------|--------------------|---------------------------|---------------|---------------------|
| V | 5 D 01 PHY | 2 | 2 | 2 |

COURSE OUTCOME

CO1:Understand the basic concepts of climate change science

CO2:Understand some of the potentially serious consequences of climate change

CO3:Analyse linkages between climate change adaptation and development planning.

CO4:Describe relevant policy approaches and strategic frameworks for climate change mitigation

CO5:Identify international initiatives which support countries to plan for climate change

Unit 1: The basics of climate change science.

8Hrs

An overview of key concepts such as weather, climate, and concept of energy balance; the greenhouse gas effect, and their main sources -the circulation in the atmosphere and ocean, and human contribution to climate change - some of the main observed changes in the climate since the industrial revolution- projected future trends and impacts of climate change on surface temperature, precipitation, ocean pH, sea-level and Arctic sea-ice extent. - overview of main sources of scientific climate information, relevant programmes and institutions.

Unit2: An overview of some of the potential consequences of climate change 5Hrs

sea level rise- flood, drought, extreme weather events and disruption of the global food supply that could have major negative impacts on humanity- the uncertainties in how the future may unfold, the important concept of risk as a means of dealing with uncertainty, and the different levels of risk associated with different consequences.

Unit3: Climate Change Adaptation

7Hrs

key definitions and some of the expected consequences of climate change on key sectors.-framework for assessing climate vulnerability. -different adaptation measures

that can be implemented for various vulnerable sectors- a short introduction to linkages between climate change adaptation and development- important international adaptation initiatives and programmes.

Unit 4: Climate Change Mitigation

5hrs

Key definitions of mitigation and an overview of emissions levels and mitigation targets per country.-ways to integrate mitigation into development planning, through low-emission development strategies. -the main economic sectors where mitigation actions can be applied.-some of the key international mechanisms created to assist countries in planning and implementing mitigation actions.

Unit 5: Planning for Climate Change

7Hrs

overview of different dimensions and entry points for climate change planning.- the roles of national and sectoral, as well as sub-national institutions in climate change planning- five-step methodology for preparing a low-emission climate- resilient development strategy- some of the main international initiatives to support climate change planning.

Book for study

1 Introduction to climate change:lecture notes for Meteorologists: Prepared byDavid D. Houghton

References:

1. An Introduction to Atmospheric Physics : D.G. Andrews
2. Descriptive Physical Oceanography : G Dietrich
3. The Physics of Atmospheres : John Houghton
4. The Discovery of Global Warming : Spencer R Weart
5. Storms Of My Grandchildren : James Hansen
6. Evaluating Climate Change Action for SustainableDevelopment: Juha I. Uitto, JyotsnaPuri, Rob D. van den Berg

MARKS INCLUDING CHOICE:

| Unit | Marks |
|-------------|--------------|
| I | 8 |
| II | 4 |
| III | 6 |
| IV | 4 |
| V | 8 |

PATTERN OF QUESTIONS

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| Part A | Short answer | (6 questions x Mark 1 = 6) |
| | Answer all questions | (6 questions x Mark 1 = 6) |
| Part B | Short Essay | (6 questions x Marks 2 each =12) |
| | Answer any 6 questions | (4questions x Marks 2 each=8) |
| Part C | Essay | (2questions x Marks 6 each =12) |
| | Answer any 4 questions | (1question x Marks 6 each=6) |
| <ul style="list-style-type: none">• Total marks including choice -30• Maximum marks of the course-20 | | |

5 D 04 PHY:JOY OF STAR WATCHING

| SEMESTER | COURSE CODE | HOURS PER WEEK | CREDIT | EXAM HRS |
|----------|-------------|-------------------|--------|-------------|
| V | 5 D 04 PHY | 2 | 2 | 2 |

COURSE OUTCOME

CO 1: Understand Our Universe and its origin

CO2: Understand simple constellations

CO3: Explain the stars in Kerala culture

CO4: Understand the techniques of star watching

Unit I: Astrophysics

12Hrs

The study of the Universe - Problems and prospects. The Universe - its origin-
_Galaxies__Milkyway. A star is born. The death of a star. The comets—The pole star

(Book 1)

Unit II: The constellations

2 Hrs

Orion- Canis major-Taurus—Leo

(Book 2)

Unit III Stars in Kerala culture

10Hrs

The origin and expansion of Astrology -Stars and constellations in Kerala culture-

(Book 2)

Unit IV: Star watching

8 Hrs

How to experience star watching — For a better view

(Book 2)

Books for study:

1. The Great Universe- G.K.Sasidharan- S.Chand
2. Joy of star watching – BimanBasu- National Book Trust , India.

Book for reference:

1. Jyothishavum Jyothisasthravum- K. Pappooty-K.S.S.P

MARKS INCLUDING CHOICE:

| Unit | Marks |
|------|-------|
| I | 8 |
| II | 5 |
| III | 8 |
| IV | 9 |

PATTERN OF QUESTIONS

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|
| Part A | Short answer | (6 questions x Mark 1 = 6) |
| | Answer all questions | (6 questions x Mark 1 = 6) |
| Part B | Short Essay | (6 questions x Marks 2 each =12) |
| | Answer any 6 questions | (4questions x Marks 2 each=8) |
| Part C | Essay | (2questions x Marks 6 each =12 |
| | Answer any 4 questions | (1question x Marks 6 each=6) |
| <ul style="list-style-type: none">• Total marks including choice -30• Maximum marks of the course-20 | | |