

# Atmospheric Physics, PHU 5302

## Information Sheet-2023/2024

### Department of Physics

#### **Dear Student,**

Welcome to the course on Atmospheric Physics offered by the Department of Physics, Faculty of Natural Sciences, the Open University of Sri Lanka (OUSL). This course is offered at Level 5 as a 3-credit course for the B.Sc. Degree programme.

#### **(1) Course materials**

The course has three units. The first and second units have 7 sessions, and the third unit has 11 sessions. Each unit addresses some of the learning outcomes that have been identified for this course. Each session begins by listing the main points of the issue being discussed.

You can collect the Unit 1, 2 and 3 of PHU5302 at the Dispatch Unit in the regional center where you are registered.

#### **(2) Topics covered in the Course**

**Unit 1:** Earth and its atmosphere, Vertical change of temperature, Atmospheric Boundary Layer, Wind, Horizontal winds, The atmospheric circulations, Physical properties of air.

**Unit 2:** Atmospheric pressure, Atmospheric thermodynamics, Atmospheric moisture, Moisture indicators, Atmospheric stability, The hydrostatics of special atmosphere, Thermodynamic diagrams

**Unit 3:** Atmospheric radiation, Clouds, Precipitation, Thunderstorm environment, Atmospheric optical phenomena, Atmospheric electricity, Atmospheric dynamics, Weather observations, Climate.

### **(3) Aim & Learning Outcomes:**

#### **Main Aim**

The course provides quantitative overview of the Earth's atmosphere and underlying atmospheric processes that lead to the weather we experience. The student will acquire fundamental understanding of the atmospheric concepts particularly about its physical aspects.

#### **Learning Outcomes**

After you have studied this course, you should be able to

- Describe the basic structure of earth's atmosphere.
- Explain the forces affecting the wind flow in atmosphere.
- Relate atmospheric forces to general circulation and geostrophic flow.
- Apply fundamental thermodynamics for dry and moist air.
- Derive expressions for variation of atmospheric pressure and density with height.
- Determine atmospheric stability from a vertical temperature profile.
- Interpret thermodynamic diagrams, as a tool of weather prediction
- Describe the components of atmospheric radiation.
- Identify how clouds and precipitation is created.
- Distinguish various thunderstorm environment.
- Identify the optical and electrical phenomena in atmosphere.
- Apply the basic equations of fluid dynamics on atmospheric flow.
- Explain the principles and techniques in weather observations.
- Describe the major climatological features in the atmosphere and explain the physical principals behind them.
- Demonstrate critical and analytical skills to interpret natural weather and climate phenomena.
- Solve atmospheric physics problems.

Day-Schools (DS) will be online (zoom) sessions during 2021. Although student participation is not compulsory, students are strongly advised not to miss day school lectures. Make sure you read the relevant course material and attempt to answer the activities integrated in the Unit before attending each DS.

#### (4) Day Schools

##### Day Schools (DS) in 2023

Month	Date	Time	Activity	Remarks
June	19- Mon	8.00 am – 10.00 am 10.30 am – 12.30 pm	DSM-1	Sessions 1 - 7
July	4 - Tue	3.30 am – 5.30 pm	DSA-2	Sessions 8 - 12
July	19- Wed	10.30 pm - 12.30 pm	DSM-3	Sessions 13 – 17
Aug	21-Mon	6.00 pm - 8.00 pm	DSN-4	Sessions 18 – 22
Sep	12 -Tue	1.00 pm – 3.00 pm 3.30 pm – 5.30 pm	RDSA-5	Sessions 23- 25 Revision

**DSM-** Day School Morning, **DSA-** Day School Afternoon, **DSN-** Day School Night, **RDSA-** Revision Day School Afternoon

#### (5) Continuous Assessment and Final examination

##### NBT Timetable-PHU5302 in 2022

NBT	Date	Time
NBT 1 (OS)	23- July- 2023 (Sun)	2.30 - 3.30 pm
NBT 2 (OS)	01- Sep- 2023 (Fri)	9.00 - 10.00 am

*For more information on examinations, please refer the prospectus 2023/24*

#### (6) Online component of the Course -Moodle

The course website will always contain the most up-to-date information possible regarding the course. You are responsible for all announcements posted on the course web site, so please check the web site frequently.

#### (7) Senior coordinator of PHU 5302:

Dr. (Mrs.) H.K.W.I. Jayawardena, Colombo (CRC)

Tel: 0112881267 email: hkjay2@ou.ac.lk

### **(8) Contact Details of the coordinators at other Regional Centers:**

<b>Regional center</b>	<b>coordinator</b>	<b>Telephone</b>
Kandy (KRC)	Dr. G.K.R Senadheera	071 8470973
Matara (MRC)	Mr. D. Maduranga	071 9410026
Anuradhapura (ARC)	Mr. Prabhath Herath	071 8308804

### **(9) Examination and Evaluation**

#### **Continuous Assessment (CA):**

CA for this course includes TWO No Book Tests (NBT).

#### **No Book Test (NBT):**

The NBT examination will be of 1-hour duration during the activity period. (Refer the CAT timetable above). It should be noted that the NBTs are compulsory.

#### **Overall Continuous Assessment Marks (OCAM):**

The student has to sit for final examination based on the Overall Continuous Assessment Marks (OCAM) calculated from both NBT Marks, NBT1 and NBT2.

OCAM mark is calculated according to the following criteria.

$$\text{OCAM} = 0.6 \text{ best NBT} + 0.4 \text{ other NBT}$$

You will be Eligible to sit for the final examination only if your **OCAM is  $\geq 35$** .

The Continuous Assessments are worth 40 % of your final grade.

#### **Final Examination (FE):**

The final examination will be of 2 hours duration. Students need to answer 04 essay/ structure type questions out of 6. The final Examination will be held at the semester end.

#### **Overall Mark (OM):**

Your final grade for the entire course will be calculated according to the following criteria.

$$\text{OM} = 40\% \text{ OCAM} + 60\% \text{ FEM}$$

#### **OCAM: Overall Continuous Assessment Marks**

FEM: Final examination Marks

**(10) Additional references:**

1. Andrews, D. D, (2010), An Introduction to Atmospheric Physics. Cambridge University Press, 237 p.
2. Wallace, J. M, and Hobbs, P. V, (2006) Atmospheric Science, Second Edition: An Introductory Survey. Academic Press, 504 p.
3. Houghton, J. T, (2002) The Physics of Atmospheres (Third Edition), Cambridge University Press, 320 p

We wish you will complete this course successfully!!