Course Synopsis

<table>
<tr><td>Course Code</td><td colspan="2">PHU5302</td><td>Level</td><td>5</td><td></td></tr>
<tr><td>Course Title</td><td colspan="5">Atmospheric Physics</td></tr>
<tr><td>Credit value</td><td colspan="5">3</td></tr>
<tr><td>Core/Optional</td><td colspan="5">Optional</td></tr>
<tr><td>Prerequisites</td><td colspan="5">Pass in the relevant science subject at the G.C.E.(A.L.) Examination or equivalent</td></tr>
<tr><td rowspan="2">Hourly breakdown</td><td colspan="2">Theory</td><td>Practical hours</td><td>Independent Learning</td><td>Assessments</td><td>Total hrs</td></tr>
<tr><td>Sessions X 2 = 25 x 2 hrs =50 hrs</td><td>DS hrs = 4 x 3 hrs = 12 hrs</td><td>Lab hrs = 0 days x 6 hrs = 0 hrs</td><td>▪ Sessions (25 x 3hrs) = 75 hrs (Online /Audio-visual materials and other learning resources)
▪ Lab (0 x 0.5) = 0 hrs
▪ Group Learning = 5 hrs</td><td>▪ Continuous Assessments (CA) = 2 hrs
▪ Practical assessments (PA) = 0 hrs</td><td>150 hrs</td></tr>
<tr><td>Course Aim/s.</td><td colspan="5">Students who follow this course should be able to gain the knowledge on basic structure of Earth atmosphere and its climate system, physical laws and the concepts governing the atmospheric processes and modern weather observation methods. They will be able to use that knowledge to analyze problems related to atmospheric processes and determine possible solutions, providing physical interpretation of weather and climate phenomena.</td></tr>
<tr><td>PLOs addressed by course</td><td colspan="5">PLO1: Knowledge - Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the BSc degree.
PLO3: Communication - Communicate reliably, efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society.
PLO4: Individual Work, Team Work and Leadership - Function effectively as an individual, and as a team member, sharing work and experiences, leading and managing assigned tasks to completion on time, demonstrating leadership to address situations in diverse and multi-disciplinary environments in day to day life.
PLO5: Creativity and Problem Solving - Identify problems and argue out and analyze such problems using qualitative and/or quantitative practical approaches in scientific methodology to provide valid conclusions.
PLO8: Vision for Life - Identify where one wants to be and develop long term goals maintaining competency to conduct scientific investigations and proceed to undertake further studies.
PLO9: Lifelong Learning - Foresee new trends and recognize their impact and update knowledge and develop new skills to meet future changes and challenges.</td></tr>
<tr><td>Course Learning Outcomes (CLO)</td><td colspan="5">Students following this course should be able to:
CLO1: Comprehend the basic physical mechanisms involved in atmospheric phenomena. (PLO1, PLO4)
CLO2: Develop the ability of applying atmospheric physics principles in meteorological weather observation techniques. (PLO 1, PLO 5, PLO 9)
CLO3: Develop the ability to express their thinking and knowledge clearly in verbal and written form, acquiring new information from other sources. (PLO3, PLO5, PLO8)
CLO4: Demonstrate critical and analytical skills to interpret natural weather and climate phenomena. (PLO1, PLO5, PLO8, PLO9)
CLO5: Solve atmospheric physics problems competently by identifying the key parts and formulating a strategy for solving the problem. Evaluate the numerical solution of a problem applying appropriate techniques and interpret the acquired result. (PLO4, PLO5, PLO8, PLO9)
CLO6: Develop critical thinking, analytical skills and problem-solving techniques to face future challenges in numerical modelling approaches of weather, and climate fields. (PLO4, PLO5, PLO8, PLO9)</td></tr>
<tr><td>Content (Main topics, sub topics)</td><td colspan="5">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 electrical phenomena, Atmospheric dynamics, Meteorological observations, Climate.</td></tr>
<tr><td>Teaching Learning methods (TL)</td><td colspan="5">• Self-Learning/Independent learning of Self-study
  • Instructional Material (IL)
  • Online Activities (OL)
  • Reference Work (RE)
• Compulsory contact sessions
  • Assessments (AS) and Feedback – MCQs (MCQ); Structured Essay (SEQ); Essay Questions (ES); Presentations (PS);
  • Assignments (A)
• Non-compulsory contact sessions
  • Day Schools (DS)
• Group Learning (GL)</td></tr>
<tr><td rowspan="2">Assessment strategy</td><td colspan="3">Overall Continuous Assessment Mark (OCAM):100 %</td><td colspan="2">Final Assessment: 100 %</td></tr>
<tr><td colspan="3">Details: Continuous Assessment (CA):
60% of Best NBT + 40% of other NBT % (2 hrs)</td><td colspan="2">Final Evaluation
Theory: 100 % (2 hrs)</td></tr>
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Recommended Readings:	[1] Andrews, D. D, (2010), *An Introduction to Atmospheric Physics*. Cambridge University Press. [2] Wallace, J. M, and Hobbs, P. V, (2006) *Atmospheric Science*, (2nd ed.). An Introductory Survey. Academic Press. [3] Houghton, J. T, (2002) *The Physics of Atmospheres*, (3rd ed.). Cambridge University Press [4] Caballero R, (2014) *Physics of the Atmosphere (IOP Expanding Physics)*, IOP Publishing Ltd. [5] Petty, G. W, (2008) *First Course in Atmospheric Thermodynamics*, Sundog Publishing.