**SSL 1105 LAND-ATMOSPHERIC RELATIONSHIPS**

**Lecturer** Dr. Lukman Nagaya Mulumba (PhD) Full time staff

**Course Type**: **CORE (B LUM I.)**

**1. COURSE DESCRIPTION**

**Course Credits (CU)**: **3 CU i.e. 45 Contact Hours per semester**

**Course Duration**: **15 weeks (45 hours)**

1. **COURSE DESCRIPTION**

The course introduces students to the relationship between land and the atmosphere and how they influence each other. It looks at the energy budget of the earth, fundamental cycles of N, water and carbon. It equips them with knowledge on causes of atmospheric pollution and how it can be mitigated. The course also introduces students to global land and environmental issues including climate change, green house gases, conventions, protocols and treaties.

**2. Course Objectives**

* Understand the interactions between land and the atmosphere and relate these to global trends.
* Understand the properties of the more important gases and how these relate to climate change
* Comprehend the dynamics of resource use, atmospheric pollution and climate change for better environmental management.

Students are expected to gain an insight and appreciate the challenges faced in getting solutions to ever increasing atmospheric pollution, global warming and how these relate to people’s livelihood.

**3. Recommended References**

Miller, T.G. (1994). Living in the Environment. Wadsworth, Inc. California.

Watson, R.T. et al. Climate change 2001:Synthesis Report (Published for the intergovernmental panel on climate change), Cambridge University Press, 2001.

**4. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND EQUIPMENT REQUIRED**

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| **WEEK/TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION / Time allocated** | **TOOLS / EQUIPMENT NEEDED** |
| 1.Introduction | * Definitions of land, earth and atmosphere; their components
 | Interactive lecture (3 hrs) | LCD projector, Chalk / BB or Markers / Flip charts |
| 1. Air and Land as essential resources
 | * Air
* Land.
 | Interactive lecture (3 hrs) | LCD projector, Chalk / BB or Markers / Flip charts |
| 4 and 5 .Fundamental cycles:  | * Nitrogen,
* Hydrological cycle,
* Carbon cycle
	+ C - sequestration
	+ Soil as a carbon sink
 | Interactive lecture (4 hrs) Classroom tutorials (4 hrs).  | LCD projector, Chalk / BB or Markers / Flip charts |
| 6. Energy budget of the earth | * Atmospheric influences on insolation
* Factors affecting the amount of solar radiation received at the top of the atmosphere
* Factors affecting the amount of solar radiation reaching the earth’s surface.
 | Interactive lecture (2 hrs).2 hr tutorial on energy budget | LCD projector, Chalk / BB or Markers / Flip charts |
| 7. Cloud Systems | * Classification
* Formation
 | Interactive lecture (3 hrs) | LCD projector, Chalk / BB or Markers / Flip charts |
| 8 and 9. The Ozone layer | * Definition
* Ozone depleting substances
* Effects of UV radiations
* Ozone and climate change
* Protection of the Ozone layer
 | Interactive lecture (3 hrs x 2) | LCD projector, Chalk / BB or Markers / Flip charts |
| 10 and 11. Degradation of the atmosphere: gaseous and particulate air degradation | * Gaseous air degradation
* Particulate air degradation
* Agents, causes and implications of atmospheric pollution
 | Interactive lecture (3 hrs x 2) | LCD projector, Chalk / BB or Markers / Flip charts |
| 12. Green house gases | * Types
* Effects
* Global warming potential
 | Interactive lecture (2 hrs) | LCD projector, Chalk / BB or Markers / Flip charts |
| 13 and 14. Global land and Environmental Issues | * Climate change
	+ Definition
	+ Causes
	+ Effects
 | Interactive lecture (3 hrs ). | LCD projector, Chalk / BB or Markers / Flip charts |
| 15. Global conventions, protocols and treaties. | * Montreal protocol
* Inter Governmental Panel on Climate Change
* United Nations Framework Convention on Climate Change
* The Kyoto Protocol
 | Interactive lecture (3 hrs) | LCD projector, Chalk / BB or Markers / Flip charts |

**5. SUMMARY OF TIME NEEDED**

Interactive lectures covering theory 35 hrs

Class room tutorials 20 hrs

**6. OVERALL COURSE EVALUATION**

Continuous Assessment Test 40%

Final examination 60%.