

# PHY7258: AEROSOLS PHYSICS

1. **Course Name:** Aerosols Physics

2. **Course Code:** PHY7258

3. **Credit Units:** 3

## 4. Course Description:

This course discusses the different sources of aerosols, their general characteristics, and their removal processes. Students will then be exposed to rigorous analysis using different particle concentrations, size and chemical compositions.

## 5. Course Objectives:

At the end of the course, the students should be able to:

- Describe the different sources and types of aerosols
- Characterize aerosols in terms of their physical and chemical properties.
- Carry out data analyses in different atmospheric conditions.
- Give an account of atmospheric electricity.

## 6. Course Outline:

Content	Hours
<b>Fundamentals of Aerosols:</b> sources and types of aerosols;	5
General characteristics: particle size, surface area, volume and mass; chemical characteristics; optical characteristics.	7
Cloud condensation nuclei: nucleation, liquid phase, ice phase; clouds and precipitation: development of super-saturation, growth by vapour deposition, growth by collision.	7
<b>Removal processes associated with aerosols:</b> atmospheric transport and fate of airborne particles.	5
Data analysis and data quality development.	5

Ambient particulate matter concentrations; chemical and size composition of particulate matter in different environments.	5
<b>Cloud-scale phenomena:</b> cloud and precipitation chemistry; aqueous-phase and acid rain	6
<b>Atmospheric electricity:</b> Principles, cloud electrification.	5
<b>Total</b>	<b>45</b>

### 7. Mode of Delivery:

This course will consist of lecture sessions and there will also be data analysis using theories learnt.

### 8. References:

- Misra, P. & Enge, P., "Global Positioning Systems: Signals, Measurement and Performance" 2nd Ed. Ganga-Jamuna Press (2006).
- Kilverson, M.G. & Russel, C.T. "Introduction to Space Physics". Cambridge Atms. & Space Sc. Series.
- Corrol, B.W. % Ostile, D.A. "An Introduction to Modern Astrophysics" 2nd Ed. Addison-Wesley.