Major X

DM-FC- 243 Fundamentals of Climatology Cr. H. 3

Course Description: This course introduces students to the basic concepts, principles, and methods of climatology, including the Earth's climate system, climate elements, climate classification, and climate change.

Course Outline:

Introduction to Climatology

- Definition and scope of climatology
- Climate vs. weather
- Climate system components (atmosphere, hydrosphere, cryosphere, biosphere)

Climate Elements

- Temperature (global patterns, anomalies)
- Precipitation (types, global patterns)
- Humidity (relative, specific)
- Wind (global patterns, circulation)

Climate Classification

- Köppen climate classification
- Thornthwaite climate classification
- Climate zones and regions

Global Climate Patterns

- Global temperature and precipitation patterns
- Climate belts and zones
- Monsoons and trade winds

Climate Change

- Definition and causes of climate change
- Evidence and impacts of climate change
- Climate change mitigation and adaptation strategies

Applied Climatology

- Climate and agriculture
- Climate and water resources
- Climate and human health

Textbooks:

1. McIlveen, R. (2022). *Fundamentals of Weather and Climate* (2nd ed.). Oxford University Press.

2. Carlson, R. F. (2023). *The Climate of the Earth: An Introduction to Meteorology and Climatology*. Routledge
3. Ahrens, C. D., & Henson, R. (2023). *Essentials of Meteorology: An Invitation to the Atmosphere* (9th ed.). Cengage Learning.
4. Oliver, J. E., & Hidore, J. J. (2022). *Climatology: An Atmospheric Science* (4th ed.). Pearson.
5. Dessler, A. E. (2022). *Introduction to Modern Climate Change* (3rd ed.). Cambridge University Press.
6. Petersen, J., Sack, D., & Gabler, R. E. (2023). *Fundamentals of Physical Geography* (11th ed.). Cengage Learning.
7. Maslin, M. (2022). *Climate Change: A Very Short Introduction* (3rd ed.). Oxford University Press.
8. Wallace, J. M., & Hobbs, P. V. (2022). *Atmospheric Science: An Introductory Survey* (3rd ed.). Academic Press.
9. Goosse, H. (2022). *Climate System Dynamics and Modelling*. Cambridge University Press.
10. Kemp, D. D., & Perry, A. M. (2023). *Principles of Meteorology and Climatology*. Springer