

HWRM-305 APPLIED CLIMATOLOGY (THEORY)

(03 Credit hrs)

PRE-REQUISITE: HWRM -103 Hydrometeorology

LEARNING OUTCOMES

Following are the learning outcomes of the course:

- Student will learn about Climate and Water Resources
- Student will learn about Climate and Weather
- Student will learn about Regional Climate
- Student will learn about Research Methods in Climatology
- Student will learn about Climate and Society

CONTENTS

THEORY

Unit-1 Climate and Water Resources

- 1.1. Climate and Water Resources
- 1.2. The Global Hydrologic System
- 1.3. The Water Budget at The Earth's Surface
- 1.4. Evapotranspiration, Soil Moisture and Ground Water, Runoff and Floods
- 1.5. Climatic Causes of Floods
- 1.6. Runoff Forecasting
- 1.7. Snow Surveying
- 1.8. Water Resources Management
- 1.9. The Greenhouse Effect
- 1.10. The Runaway Greenhouse Effect

Unit-II Climate and Weather

- 2.1. Basic principles of the general circulation
- 2.2. Climate, and weather
- 2.3. Explore principles of general circulation and atmospheric motion that are critical to understanding relationships between regional climates and regional climate variability

Unit-III: Regional Climate

- 3.1. Regional climate and society
- 3.2. Explore relationships among regional climate variability,
- 3.3. Agriculture
- 3.4. Transportation
- 3.5. Resource management
- 3.6. Health, and energy

Unit-IV: Research Methods in Climatology

- 4.1. Research and methods in climatology
- 4.2. Explore current research topics in climatology
- 4.3. Identify various means of generating regional climatologist
- 4.4. Research projects that link regional climatologies to social-economic endeavors.

Unit-V: Climate and Society

- 5.1. Climate, Agriculture, And Food

- 5.2. Climate Modification, Past Climates, And Climate Forecasting
- 5.3. Forecasting Climate, Energy, And Industrial Technology
- 5.4. Climate and Soil Erosion, Marine Life
- 5.5. Sediments and Past Climates
- 5.6. Effects of Winds and Currents On Fisheries
- 5.7. Climate and The Biosphere

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Hidore, J. J. Oliver, J. E. Snow, M. and Snow, R. (2009): *Climatology: An atmospheric science* (3rd Ed.). Prentice Hall. 408 pp.
2. Pierre, G. (ed.). (2010). *Geographical Information and Climatology*. Wiley Press.
3. Hartmann, D. (1994): *Global Physical Climatology*. Academic Press. 411 pp.
4. Rohli, R. and Vega, A. J. (2015): *Climatology* (Revised Edition) Jones & Bartlett Learning.