GEOG-302 Geomorphology

Course Brief:

Geomorphology is the study of landforms, their processes, form and sediments at the surface of the Earth (and sometimes on other planets). Study includes looking at landscapes to work out how the earth surface processes, such as air, water and ice, can mold the landscape. Landforms are produced by erosion or deposition, as rock and sediment are worn away by these earth-surface processes and transported and deposited to different localities. The different climatic environments produce different suites of landforms. The landforms of deserts, such as sand dunes and ergs, are a world apart from the glacial and periglacial features found in polar and sub-polar regions. So, geomorphology is a diverse discipline.

Course Learning Objectives:

The basic geomorphologic principles can be applied to all environments, Geomorphologists tend to specialize in one or two areas, such Aeolian (desert) geomorphology, glacial and periglacial geomorphology, volcanic and tectonic geomorphology, and even planetary geomorphology. Most research is multi-disciplinary, combining the knowledge and perspectives from two contrasting disciplines, combining with subjects as diverse as ecology, geology, civil engineering, and hydrology and soil science.

Course Contents:

I. Introduction

i. Definition and Scope
ii. Development of Science of Geomorphology
iii. Muslims Contribution to the Science of Geomorphology

II. Models of Landform Development

i. Structural Landform
ii. Weathering Landforms
iii. Erosional Landforms
iv. Depositional Landforms

III. Geomorphic Process

i. Endogenetic Processes
ii. Exogenetic Processes
iii. Extra-terrestrials Processes

IV. Weathering

i. Physical Weathering
ii. Chemical Weathering
iii. Biological Weathering

V. Mass Wasting

i. Slow Flowage Type
ii. Rapid Flowage Type
iii. Subsidence

VI. Glacier

i. Genesis and Motion
ii. Classification

iii. Nourishment and Wastage
iv. Erosional and Deposition Landforms

VII. Fluvial Processes

i. Fluvial Cycle
ii. Rejuvenation
iii. Idealised Fluvial Cycle
iv. Complications of the Field Cycle
v. Drainage Pattern

VIII. Arid Cycle and Aeolian Landforms

i. Forms of Wind Erosion
ii. Wind Transportation
iii. Wind Deposition

IX. Karst Topography

i. Development of Karst Landscape
ii. Characteristic of Karst Features

X. Quantitative Geomorphology

i. Methods of Geomorphological Investigation
ii. Morphometric Analysis
iii. Material Properties
iv. Process and Evolution

XI. GIS and RS Applications

i. Data Acquisition
ii. Digital Terrain Modelling
iii. Feature Extraction

Books Recommended:

- Thomas M. Lillesand & Ralph W. Kiefer 2004 Remote Sensing and Image Interpretation. John Wiley & Sons Inc.
- John. R.J. 1996 Introduction to Digital Image Processing. Prentice Hall.
- Aronoff, S. 1995 Geographic Information Systems: A Management Perspective, Wdl Publications, Ottawa, fourth edition Canada.
- Drwry S.A. 1990 A Guide to Remote Sensing and Image Processing, University Press Oxford.
- Sparks, B.W. 1986 Geomorphology, Longman London.
- Paul J. Curran, 1985 Principles of Remote Sensing. Longman Group Ltd.
- Thornsbury, W.D. 1983 Principles of Geomorphology, John Wiley New York.
- Wooldrige S.W. 1966 An Outline of Geomorphology, Physical Basis of Geography, Longman.
- Steers, J.A.1964 Unstable Earth.
- Cotton, C.A. 1949 Geomorphology An Introduction to the Study of Landform, John Wiley New York.
- Englen O.D.V. 1942 Geomorphology, Macmillan New York.
- Lobeck, A.K. 1939 Geomorphology, Macmillan New York.