Bot.Sp-01 APPLIED PALEOPALYNOLOGY Credit Hours: 3(2+1)

THEORY:

Introduction to the course:

The primary mission of this course is to provide with a set of practical skills that will allow you to date a rock sample and reconstruct the climate at the time of deposition, based on constituent palynomorphs.

Course Objectives:

The aim of the course is:

1) Explore the function and morphology of pollen and spores, using modern specimens as the primary examples.

2) Examine the organic evolution of plants, from the Cambrian colonization of the land to the Cretaceous rise of flowering plants, as recorded by fossil pollen and spores.

3) Understand the relationships between temperature, precipitation and vegetation cover.

Course Detail:

1. Introduction
   1.1. Scope and Importance.
2. Geological Time Scale.
3. Rock types.
4. Palaeozoic and Mesozoic sedimentary outcrops.
5. Palynomorphs in oil and gas exploration and in Stratigraphic Correlation.
6. Palynomorphs as sedimentary particles.
7. Preservability in sediments.Vegetational analysis from pollen analytical data.
8. "Stratigraphic leak" and Reworking. Post Depositional alteration of palynomorphs.
9. Marginal paleopalynology. Shell Code, Ultra structure of Exine.
10. Coal, formation and Classification.
11. Gondwanaland Palynofloristics
    11.1. Formation and sequence of breakup of Gondwanaland and its effect on the flora.

Practicals:

1. Map reading, use of clinometer and other instruments in the field.
2. Field survey of Mesozoic and Palaeozoic sedimentary outcrops of the higher / Lesser Himalayas.
3. Various techniques employed in identification and sampling of sedimentary rocks including section measurement.
4. Lithological description of sedimentary rock samples.
5. Observation, identification, technical and systematic description of the palynomorphs through Bulk and Powder maceration.
6. Preparation of strew mount and single grain slides.
7. Polaroid / Cross Nickol Microscopy.
8. Preservation and 51aleopalyno of palynoflora. Candidates shall be required to submit a Technical Report" at the time of Practical examination covering all aspects of fieldwork accomplished.

Teaching-learning Strategies

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

Learning Outcome:

Students will be able to:

1. Compare and contrast the function and morphology of pollen and spores
2. Describe and illustrate modern and fossil spores and pollen grains
3. Date any palynomorph-bearing sample to the correct geologic period
4. Reconstruct vegetation and paleoclimate based on palynomorph assemblages

Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

Recommended Readings:

1. Traverse, A. *Paleopalynology*. Unwin Hyman Ltd.
2. Stratigraphic Memoirs of Geological Survey of Pakistan. Vol. 12.
3. Wadia, D.N. *Geology of India*. Tata Mcgraw Hill Publishing Co., New Delhi, India.
4. Andrews, H.N. Ancient plants and the World They Live in Comstock, Ithaca, New York.

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