Institute of Zoology
Faculty of Life Sciences
University of the Punjab, Lahore

Course Outline

Programme	BS Zoology	**Course Code**	**ZOOL-406**	**Credit Hours**	2
Course Title	**Principles of Paleontology**				

Course Introduction

This course is designed to introduce the basic principles of paleontology - the study of fossil organisms in the geological record. Topics to be covered include: processes of fossilization; principles of evolution as evidenced by the fossil record; taxonomy and the recognition and naming of fossil species; biostratigraphy as a means of dating a rock and/or learning about ancient environments; geochemistry of fossils as a means to understand ancient habitats and behaviors.

Learning Outcomes

On the completion of the course, the students will:

1. **Acquire** theoretical knowledge about prehistoric life at different stages of Geological Time Scale.
2. **Compare** different osteology of vertebrate groups.
3. **Collect** the fossils from field.
4. **Evaluate** the paleoecology and paleoenvironment associated with different faunal elements.

Course Content		**Assignments/Readings**
Week 1	**Unit-I** 1.1 Paleontology 1.1.1 Definition, Introduction	Introduction
	Unit-II 2.1 Paleontology 2.1.1 History	History
Week 2	**Unit-III** 3.1 Paleontology 3.1.1 Contribution / Importance	Contribution
	Unit-IV 4.1 Fossils 4.1.1 Fossil Formation	Fossil definitions - Taphonomy
Week 3	**Unit-V** 5.1 Fossils 5.1.1 Fossil Types	Fossilization
	Unit-VI 6.1 Fossils 6.1.1 Fossil Formation	Fossilization
Week 4	**Unit-VII** 7.1 Geological Time Scale 7.1.1 Precambrian Life	Eon, Era
	Unit-VIII 8.1 Geological Time Scale 8.1.1 Post Cambrian Life	Period, Epoch

Week 5	**Unit-IX** 9.1 Rocks 9.1.1 Sedimentary Rocks	Sedimentation
	Unit-X 10.1 Rocks 10.1.1 Igneous and Metamorphic Rocks	Rock types
Week 6	**Unit-XI** 11.1 Prehistoric Life 11.1.1 Paleozoic Life	Paleozoic Life
	Unit-XII 12.1 Prehistoric Life 12.1.1 Mesozoic Life	Mesozoic Life
Week 7	**Unit-XIII** 13.1 Prehistoric Life 13.1.1 Cenozoic Life	Cenozoic Life
	Unit-XIV 14.1 Prehistoric Life 14.1.1 Dinosaurs	Dinosaurs
Week 8	**Unit-XV** 15.1 Prehistoric Life 15.1.1 *Archaeopteryx*	*Archaeopteryx*
	Unit-XVI 16.1 Prehistoric Life 16.1.1 Trilobites	Trilobites
Week 9	**Unit-XVII** 17.1 Geochronometry 17.1.1 Introduction	Rock dating
	Unit-XVIII 18.1 Geochronometry 18.1.1 Carbon dating	Fossil dating
Week 10	**Unit-XIX** 19.1 Geochronometry 19.1.1 Uranium/Lead dating	Fossil dating
	Unit-XX 20.1 Geochronometry 20.1.1 Paleomagnetism	Fossil dating
Week 11	**Unit-XXI** 21.1 Geochronometry 21.1.1 Fission track dating	Fossil dating
	Unit-XXII 22.1 Geochronometry 22.1.1 Biostratigraphy	Fossil dating
Week 12	**Unit-XXIII** 23.1 Earth 23.1.1 Introduction	Earth
	Unit-XXIV 24.1 Earth 24.1.1 Subsystems of Earth	Atmosphere, Hydrosphere, Biosphere, Lithosphere
Week 13	**Unit-XXV** 25.1 Mammalian Evolutionary History 25.1.1 Human Evolution	Introduction

	Unit-XXVI 26.1 Mammalian Evolutionary History 26.1.1 Human Evolution	Evolutionary types
Week 14	**Unit-XXVII** 27.1 Mammalian Evolutionary History 27.1.1 Horse Evolution	Introduction
	Unit-XXVIII 28.1 Mammalian Evolutionary History 28.1.1 Horse Evolution	Evolutionary types
Week 15	**Unit-XXIX** 29.1 Mammalian Evolutionary History 29.1.1 Elephant Evolution	Introduction
	Unit-XXX 30.1 Mammalian Evolutionary History 30.1.1 Horse Evolution	Evolutionary types
Week 16	**Unit-XXXI** 31.1 Mammalian Evolutionary History 31.1.1 Camel Evolution	Introduction
	Unit-XXXII 32.1 Mammalian Evolutionary History 32.1.1 Camel Evolution	Evolutionary types

Textbooks and Reading Material

1. Young J.Z., 2001. (3rd edition). Life of vertebrates. London, Oxford Univ. Press.
2. Dunbar C.O., 1960. Historical Geology. John Willey and Sons Inc. New York.
3. Brouwer, A., 1977. General Palaeontology, Oliver and Boyed, London.
4. Glbert, Colbert, E.H., 1980. Evolution of vertebrates, John Willey and Sons Inc. New York.
5. Moore, R.C. Lalicker, G.C., Fisher, A.G., 2004. Invertebrate Fossils. McGraw-Hill, New York.
6. Steven M. Stanley, 2014. Earth system History. 3rd addition.
7. Michael Foote and Arnold I. Miller, 2007. Principles of Palaeontology (3rd Ed.) Freeman & Company.
8. Michel J. Benton, 2015. When Life Nearly Died: The Greatest Mass Extinction of All Time. Thames & Hudson.

Teaching Learning Strategies

Class lectures, Class discussions, Group work, Documentary

Assignments: Types and Number with Calendar

Assignments as mentioned in the above column.

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination 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.