Detailed Syllabus of Paleobiology and Paleoecology

Contents: The proposed course will include the following topics -

- What are the taphonomic processes and how these processes can influence fossilization of an organism? What can we learn about these processes by looking at the modern world?
- What is the meaning of adaptation? How adaptations of any organism interact with its' success?
- What are the different modes of evolution? How these modes influence tempo of evolution?
- How long-term morphological trends are developed? How to differentiate between trends based on their underlying causes?
- How biodiversity have been changed across the Phanerozoic? What are the biases of this trend? How to measure biodiversity in the fossil record?
- What are the mass extinction events? What are their causes, intensities and selectivity patterns? How do ecosystems recover from a biotic crisis event?
- What is community structure and how does it evolve?
- How do we develop an integrated approach involving different tools, such as isotope geochemistry, paleobiology, sedimentology, to explain specific phenomenon in the fossil record?
- Are we in a present day biotic crisis? Is it different from the past biotic crisis events?

Detailed Syllabus (lecture-wise breakup)

Topic	No. of lectures
Taphonomy: processes	1
Taphonomy: Biases of fossil record, the effect of time averaging	2
Taphonomy: Live-dead comparison	1
Adaptation : Adaptative landscape	2
Adaptation : Adaptation and exaptation	1
Evolution : Pattern and processes	2
Evolutionary rates & trends	4
Diversity: methods and temporal trends	2
Diversity: spatial and environmental pattens	2
Mass extinction: Origination vs extinction rates	2
Mass extinction: Intensity, selectivity, cause	3
Mass extinction: Recovery	3
Paleoecology: Community structure and trophic levels	2
Paleoecology: Ecological arms race – Escalation and co-evolution	2
Paleoecology: Evolutionary paleoecology	1
Multidisciplenary approach in Paleontology: a case stydy from PETM	1
Paleontology and society: Present biotic crisis	2