

Department of Earth Sciences
Indian Institute of Technology Kanpur

Proposal for a new course

1. Course No: ES6XX
2. Course title: Sequence Stratigraphy
3. Department: Earth Sciences
4. Proposing Instructor: Dr. Hiranya Sahoo
5. Units: 3-0-0-0 (9 credits)
6. Course Type: Departmental Elective (PG)
7. Prerequisite: Sedimentology (ES205) and Stratigraphy (ES301) for UGs; PGs - Applied Sedimentology and Basin Analysis (ES653A) or with permission of the instructor
8. Other Potentially Interested Faculties: NONE

Course Description

Sequence stratigraphy emerged as a paradigm shift in the discipline of stratigraphy. This emergent branch of stratigraphy proved to be popular in industry and academia owing to its wide applicability in energy exploration and in delivering analysis with a time-space reference. In particular, contrary to the classical lithostratigraphic approach, sequence stratigraphy allows the investigation with genetically-linked, hiatus-bounded strata in a chronostratigraphic framework. Broadly, in this course, the students will learn various concepts and tools of sequence stratigraphy that will help their academic preparation and professional career. This course will focus on aspects of: terminology and methods of sequence stratigraphy, and their application to subsurface reservoirs; concepts of hierarchy of stratigraphic architecture at various scales (from parasequence to systems tracts to sequence); criteria-based interpretation and recognition of sequence stratigraphic surfaces in outcrops, subsurface core-cuttings, wireline logs, and seismic sections; comprehension on similarities and dissimilarities among several sequence stratigraphic models (depositional sequence stratigraphy, transgressive-regressive sequence stratigraphy, genetic sequence stratigraphy, etc.), on analysis of clastic vs. non-clastic (carbonate) sequence stratigraphy; use of (nearby) field locations for field training of various concepts. Overall, this course will help the students how to think and communicate like a sequence stratigrapher within the wider context of sedimentary geology.

Course Contents	Suggested number of lectures
Introduction, History, Facies	4

Methods: outcrops, cores, well logs, seismic	3
Accommodation, Base level, Shoreline trajectory	3
Sequence stratigraphic surfaces	3
Systems tracts	5
Fluvial sequence stratigraphy	3
Incised valley system	3
Paralic sequence stratigraphy	2
Deepwater and Carbonate sequence stratigraphy	3
Exercises on accommodation, cross section, wheeler diagram	4
Exercises at various scales (from parasequence to systems tracts to sequence)	4
Synthesis: Standardizing sequence stratigraphy	3
Total number of lectures	40

Recommended Books/Resources:

- Catuneanu, O., 2022, Principles of Sequence Stratigraphy, 2nd ed., Elsevier, Amsterdam. ISBN: 9780444533531
- Emery, D., and Myers, K.J., eds., 1996, Sequence Stratigraphy; Blackwell Science, Oxford.
- Coe, A.L., ed., 2005, 1st ed. (reprint with corrections) The Sedimentary Record of Sea-Level Change; Cambridge University Press, Cambridge.
- <http://www.sepmstrata.org/page.aspx?pageid=229>
- Published research articles/guidebooks/reports

Dated: 11 March 2026


Proposer: Dr. Hiranya Sahoo

Dated: 12 March 2026


DUGC/DPGC Convener, ES

The course is approved/ not approved

Chairman, SUGC/SPGC

Dated: _____