Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NGLD508	Sequence Stratigraphy and Basin Analysis	3	0	0	3

Course Objective

In this course the students will study the fundamental concepts, principles and applications of sequence stratigraphy and basin analysis

Learning Outcomes

Upon completion of the course, students will be able to:

- Understand the basic concepts of base level of erosion, transgression and regression.
- Know various types of stratigraphic surfaces and their uses.
- Understand the basic concepts of system tracts and depositional sequence.
- Understand various types of sedimentary basins, their formation mechanisms
- Understand basin subsidence and thermal maturation of sediments

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Historical developments, definitions and key concepts, base level changes, transgressions and regressions	6	Understand the basic concepts of base level of erosion, transgression and regression
2	Stratigraphic surfaces: Stratal terminations, sequence stratigraphic surfaces. Unconformity and correlative conformity	6	Know various types of stratigraphic surfaces and their uses
3	Systems Tracts: Lowstand, Transgressive, Highstand, Falling stage. Shelf-margin system tract (SMST) Unconformities: Type I, Type II and Type III	6	Understand the basic concepts of system tracts
4	Sequence Models: Depositional sequence, Genetic stratigraphic sequence, Transgressive-Regressive sequence. Hierarchy of sequences and bounding surfaces	4	Understand the hierarchy of Sequence
	Basin Analysis		
5	Definition and scope of basin analysis	2	Basics of basin analysis
6	Basin mapping methods: structure and isopach contouring, lithofacies maps, palaeocurrent analysis	2	Learn the basin mapping method
7	Regional and global stratigraphic cycles. Tectonic classification of sedimentary basins.	3	Learn about tectonic classification of sedimentary basins
8	Characteristics of divergent margin basins, convergent margin basins, transform and transcurrent fault basins, basins developed during continental collision and suturing and cratonic basins.	4	Understand the character of various types of sedimentary basins
9	Geohistory analysis	4	Learn about the concept of basin subsidence
10	Thermal history	3	Learn about the concept of thermal maturation in a basin
11	Review of Indian basins	2	Learn about Indian Sedimentary basins
	Total Classes	42	

Text books:

1. Andrew Miall – Principles of Sedimentary Basin Analysis. Springer, New York, 1990.
2. Coe, A.L. ed., 2003. The sedimentary record of sea-level change. Cambridge University Press.
3. Miall, A.D., 2010. The geology of stratigraphic sequences. Springer Science & Business Media

Reference Books:

1. Catuneanu, O., 2020. Sequence stratigraphy. In Regional Geology and Tectonics (605-686). Elsevier.
2. Nichols, G., 2009. Sedimentology and stratigraphy. John Wiley & Sons.
3. Allen, P.A. and Allen, J.R., 2013. Basin analysis: Principles and application to petroleum play assessment. John Wiley & Sons.