

Name of Programme: M. Sc. Applied Geology
Course Code: GEO-633
Title of the Course: Petroliferous basins of India
No of Credits: 03
Effective from AY: 2023-24

Prerequisites for the course:	Students should have undergone M.Sc. Semester I and II.	
Objective:	To impart the knowledge about Petroliferous basins in India. To understand its occurrence, structure and depositional environment	
Content:	Module 1 Types of petroliferous basins, relations between basin type and hydrocarbon richness; classification of petroliferous basins of India in the framework of Plate tectonics. Cambay basin: Cambay rift and post rift deltaic sedimentation, Lithofacies, depositional environment, organic matter, palynological investigation and reservoir characteristics. Bombay offshore basin: Exploration, seismic study, transgressive-regressive cycle, carbonate facies, reservoir petrography, source rock geochemistry and future prospects along western slope of India.	15 hours
	Module 2 Assam shelf: Depositional environment, structure, tectonics, bio-zonation, hydrocarbon prospects, source rock and associated lithology. Krishna-Godavari basin: Lithology, depositional pattern, petroleum systems and fossils. Bengal basin: Marine depositional environments, clay mineralogy, trace elements and fossil assemblages. Cauvery basin: General geology, tectonic history, sea level changes, modelling and basin analysis. Andaman basin: Structural analysis, its interpretation and evolution of forearc basin.	15 hours
	Module 3 Rajasthan Basin: Hydrogeochemical studies in Jaisalmer basin, Hydrocarbon entrapment conditions and related lithology. Kerala-Konkan basin: Tectonic framework, geology and petroleum prospects. Geoscientific studies and hydrocarbon exploration techniques in Himalayan foothills, Vindhyan and Gondwana basin: Hydrocarbon exploration techniques. Palar basin: Tectonic history, structure and hydrocarbon habitat. Mahanadi basin: Geology and hydrocarbon prospects.	15 hours
Pedagogy:	Lectures, case studies, discussions and assignments.	
References/Readings	1. Bhandari, L.L., Venkatachala, B.S., Kumar, R., Swamy, S.N., Garga, P. and Srivastava, D.C. (Eds.) (1983). <i>Petroliferous Basins of India</i> , Petroleum Asia Journal, Himachal Times Group. 2. Biswas, S.K., Dave, A., Garg, P., Pandey, J., Maithani, A. and Thomas, N.J.	

	(Eds.) (1993) <i>Proceedings of 2nd Seminar on Petroliferous Basins of India, Dehra Dun, Dec.18-20, 1991, Vol. 1 & 2</i>, Indian Petroleum Publishers, Dehra Dun. 3. Biswas, S.K., Dave, A., Garg, P., Pandey, J., Maithani, A. and Thomas, N.J. (Eds.) (1994) <i>Proceedings of 2nd Seminar on Petroleum basins of India, Dehra Dun, Dec. 18-20, 1991, Vol.3</i>, Indian Petroleum Publishers, Dehra Dun. 4. Chandra, K., Raju, D. S. N., & Mishra, P. K. (1993). Sea Level Changes, Anoxic Conditions, Organic Matter Enrichment, and Petroleum Source Rock Potential of the Cretaceous Sequences of the Cauvery Basin, India. AAPG special volume 5. Gupta, S. K. (2006). Basin architecture and petroleum system of Krishna Godavari Basin, east coast of India. <i>The Leading Edge</i>, 25(7), 830-837. 6. Hasan, S. Z., Farooqui, M. Y., Rao, P. H., Ramachandran, K., Tripathy, P., & Harinarayana, T. (2013). <i>Petroliferous basins and shale gas-an unconventional hydrocarbon asset of India. Geosciences</i>, 3(4), 108-118. 7. Singh, L. (2000) <i>Oil and Gas Field of India</i>, Indian Petroleum Publishers, Dehra Dun.
Course outcomes	1. Students will be able to understand Petroliferous basins in India. 2. Know about the geological environment and tectonic setting. 3. Learn about various Geoscientific studies and hydrocarbon exploration techniques. 4. Understand its potential with respect to hydrocarbon occurrence.