Course Outline

Course Type	Course Code	Name of the Course	L	T	P	Credits
DC	NGLC515	Coal Geology	3	0	0	3

Course Objective

The primary objective of the course is to introduce fundamental aspects of coal such as origin, transport, formation, types, physical properties and depositional environments and industrial utilization to the students.

Learning Outcomes

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

- Distinguish between different types of coal based on physical, chemical and petogarphical and other properties.
- Origin and effect of various depositional environments in shaping of various coal type.
- Role of Coal Geology in industrial utilization.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**AI & ML** in Coal Geology	1	Application of **AI & ML** in Coal Geology
2	**Coal and its properties:** Different varieties and ranks of coal. Type of Depositional processes. Coalification process and its causes.	5	Understanding of different varieties and ranks of coal and their origin.
3	**Structural features:** Sediments closely associated with coal.	3	This unit will help student in understanding the structural features associated with coal and their implications
3	**Lithotypes, microlithotypes and macerals:**their physical and optical properties. Maceral analysis of coal; Mineral and organic matter in coal; Perographic methods and tools of examination.	8	This will help in distinguishing various types of organo-petrograhic constituents;
4	**Industrial evaluation of coal:** Application of coal petrography. Proximate and ultimate analyses; Industrial evaluation of coal characteristics with reference to coal classification .	9	Applications of coal petrography in geological and technological processes; Industrial evaluation of coal
5	**Distribution of different coal basins:** Geological and geographical distribution of different coalfields with special reference to India. Geology and petrography of different coal basins and lignite basins of India (Jharia, Raniganj coal basins).	7	To understand distribution of various coal and lignite basins and their characteristics.
6	**Coal for various industries:** Uses of coal for various industries e.g. carbonization, liquefaction power generation, gasification and coalbed methane production;	7	This will help students in understanding of coal utilization in various technological processes.
7	**Organic Petrology:** Organic Petrology and Introduction to coal-based Nanomaterials	2	Students may understand coal-based Nanomaterials through organic petrology.
	Total Classes	42	

Text Books:

1. Taylor, G.H., Teichmüller, M., Davis, A., Diessel, C.F.K., Littke, R., Robert, P., 1998. Organic Petrology Gerbrüder Borntraeger, Berlin.16, 704.
2. van Krevelen, D.W., 1993. Coal: Typology-chemistry-physics-constitution. Elsevier Science, Amsterdam, 963.

3. 3.Applied Coal Petrology-The Role of Coal Petrology in Coal Utilization by Isabel Suárez-Ruiz and John C. Crelling (Eds) Elsevier,Academic Press (2008).

Reference Books:

1. Introduction to Geology of coal and Indian Coalfields by N.L.Sharma & K.S.V. Ram,1979
2. Coal resources of India. Mem.GSI, vol.88,1971
3. Coal Geology and Coal Technology by C.R.Ward,1984
4. Coal bearing depositional system by CFK Diessel, 1992 Edition
5. The Chemistry and technology of coal- James G. Speight,1994
6. Coal and coal bearing strata Ed. A,C.Scott,1987
7. Modern coal Minining by R.D.Singh,1995.
8. Coalbed Methane and Coal Geology-Eds. R.Gayer and I. Harris, 1996.
9. Coalbed Methane: scientific, environmental and economic evaluation-Masatalerz and others, 1999.
10. Progress of Coal Petrology in India by H.S.Pareek, 2004.
11. Coal Resources of West Bengal (Bull.Geol.Surv.Ind.Series A No.45, 2003)RK Datta,A.B.Dutt.