Coal Geology

1.1. Course Number: GE413

1.2. Contact Hours: 3-0-0 Credits: 9

1.3. Semester Offered: 4th Year-Odd

1.4. Prerequisite: Basic knowledge of Geology and Chemistry

1.5. Syllabus Committee Members: Dr. Alok Kumar Singh & Dr. Hemant Kumar Singh

2. Objective: The important objectives of the course are to introduce the students to coal, its characteristics, classification, origin, distribution, and problems in exploitation.

3. **Course Content:** Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topics	Lectures
1	Introduction to coal and its origin	Definition and origin of coal. Sedimentology of coal bearing strata, types of seam discontinuities and structures associated with coal seams. Chemical characteristics of coal.	10
2	Coal Petrology	concept of 'Lithotype', 'Maceral' and 'Microlithotype'. Classification of macerals and microlithotypes. Techniques and methods of coal microscopy. Elementary knowledge of the application of reflectance and fluorescence microscopy. Application of coal petrology. Classification of coal in terms of Rank, Grade and Type. classification for coking and non-coking coals. Elementary Idea about coal preparation, carbonization, gasification hydrogenation, Application of coal petrology in a source rock evaluation, liquefaction, gasificafication. Carbonization.	16
3	Geological and Geographical Distribution	Geological and geographical distribution of coal and lignite deposits in India. Coal exploration and estimation of coal reserves. Indian coal reserves and production of coal in India.	8
4	Coalbed Methane	Coalbed methane – a new energy resource. Elementary idea about generation of methane in coal beds, coal as a reservoir and coalbed methane exploration.	6
		Total	**40**

4. Readings:

4.1. Textbook:

- Coal Geology - Larry Thomas, Wiley Blackwell

- Coal Gassification and its applications - David A. Bell, Brian F. Towler and Maohong Fan, Elsevier
- Coal Geology and Coal Technology - Colin R. Ward, Blackwell Scientific Publications
- Textbook of Coal - D. Chandra, R. M. Singh and M. P. Singh, Tara Book Agency, Varanasi

4.2. Reference Books:

- Coalbed Methane: Principles and Practice - Rudy Rogers, Kumar Ramurthy, Gary Rodvelt and Mike Mullen,
- Coal and Organic Petrology - M. P. Singh, Hindustan Publishing Corp

5. Outcome of the course:

On successful completion of this course, students have a comprehensive knowledge of:

- Origin, structure, texture, distribution of coal and its characteristics.
- Basic of coalbed methane and its application.
- problems associated with coal exploitation.