

SECOND YEAR
FUEL GEOLOGY

Name of the Course	Geology-SECC 2: Fuel Geology
Theory	Theory-04
Code	30 Lectures
Yearly Examination	GEOL-204 TH
Continuous Comprehensive Assessment (CCA)	70 marks (3 Hrs)
	30 marks

CCA: Based on midterm exam, class test/seminar/assignments/quiz and attendance. Midterm Exam=15 marks, Class test/seminar/assignments/quiz =10 marks, Attendance=05 marks; a) $\geq 75\%$ to 80% : 3 marks b) $\geq 80\%$ to 90%= 4 marks c) $\geq 90\%$ and above = 5 Mark

Instructions for Paper Setters and Candidates:

- The question paper will consist of five sections: Section A (compulsory, covering syllabus from all the units), Section B (Unit I and II), Section C (Unit III and IV), Section D (Unit V and VI) and Section E (Unit VII and VIII). Examiner will set nine questions in all, question number 1 (One) will be compulsory and comprise one question each from all the Units. Each question from section B, C, D and E will carry 10 marks. Question Number 1 (Section-A), will consist of ten sub-questions each of 1 mark of various types such as: Multiple Choice Questions (MCQ)/fill in the blanks and/or short answer type questions.
- The candidate will be required to attempt five questions in all i.e. selecting one question from each sections B, C, D and E and ten sub-questions from section A. (Compulsory question number 1). The duration of the examination will be 3 hours.

Fuel Geology (GEOL 204TH)

Unit-I: Coal :Definition and origin of Coal; Basic classification of coal; Fundamentals of coal petrology - Introduction to lithotypes, microlithotypes and macerals in coal; Proximate and ultimate analysis.

Unit-II: Coal as a Fuel: Coal Bed Methane (CBM): global and Indian scenario; Underground coal gasification; Coal liquefaction.

Unit-III: Petroleum: Chemical composition and physical properties of crudes in nature; Origin of petroleum; Maturation of kerogen; Biogenic and thermal effect.

Unit-IV: Petroleum Reservoir and Traps: Reservoir rocks: general attributes and petrophysical properties; Classification of reservoir rocks - clastic and chemical; Hydrocarbon traps: definition, anticlinal theory and trap theory; Classification of hydrocarbon traps - structural, stratigraphic and combination; Time of trap formation and time of hydrocarbon accumulation. Cap rocks - definition and general properties. Plate tectonics and global distribution of hydrocarbon reserves; Gas hydrates and nuclear fuel.

BOOKS SUGGESTED

1. Bastia, R. and Radhakrishna, M. (2012). Basin Evolution and Petroleum Prospectivity of the Continental Margins of India, (Vol. 59. Newnes).
2. Bjorlykke, K. (1989). Sedimentology and Petroleum Geology. Springer.
3. Chandra, D. (2007). Chandra's Textbook on Applied Coal Petrology. Jijnasa Publishing House.
4. Shelly, R.C. (2014). Elements of Petroleum geology, 3rd Edn. Academic Press.

THIRD YEAR

HIMALAYAN GEOLOGY

Name of the Course	Geology-SECC 4 : Himalayan Geology
Credits	
Theory	Theory-04
Code	30 Lectures
Yearly Examination	GEOL-302 TH
Continuous Comprehensive Assessment (CCA) :	70 marks (3 Hrs)
	30 marks

CCA: Based on midterm exam, class test/seminar/assignments/quiz and attendance. Midterm Exam=15 marks, Class test/seminar/assignments/quiz =10 marks, Attendance=05 marks; a) $\geq 75\%$ to 80% : 3 marks b) $\geq 80\%$ to 90%= 4 marks c) $\geq 90\%$ and above = 5 Mark

Instructions for Paper Setters and Candidates:

1. The question paper will consist of five sections: Section A (compulsory, covering syllabus from all the units), Section B (Unit I and II), Section C (Unit III and IV), Section D (Unit V and VI) and Section E (Unit VII and VIII). Examiner will set nine questions in all, question number 1 (One) will be compulsory and comprise one question each from all the Units. Each question from section B, C, D and E will carry 10 marks. Question Number 1 (Section-A), will consist of ten sub-questions each of 1 mark of various types such as: Multiple Choice Questions (MCQ)/fill in the blanks and/or short answer type questions.
2. The candidate will be required to attempt five questions in all i.e. selecting one question from each sections B, C, D and E and ten sub-questions from section A. (Compulsory question number 1). The duration of the examination will be 3 hours.

Himalayan Geology (GEOL 302TH)

Unit-I: Formation of Tethyes Geosyncline, Phases of upheaval of Himalayas, Geological and Geographical sub-divisions of Himalayas, Stratigraphical and lithological units of Himalayas and their correlation.

Unit-II: Structures of the Himalayas; Sedimentation, Igneous activity and metamorphism in Himalayas; Mineral wealth of Himalayas, Detailed study of important rocks type of Himalayas both in hand specimen and under microscope.

Unit-III: Geosynclines, their evolution and; Plate tectonics, theories and plate movement; Sea-floor spreading theories and evidences.

Unit-IV: Concepts of Isostasy, Horst-Grabens and Rift valleys, Neo-tectonic movements and its indicators.

Books Suggested:

1. Dynamic Himalayas by K.S.Valdiya.
2. Himalayas (Geological Aspects) by P.S.Saklani.
3. Geology of Himalayas by Ganssar.
4. Tectonic aspects of Himalayas by K.S.Valdiya.
5. Understanding of the Earth by Gunter Gass.
6. Dynamics of Earth by Spincer