Syllabus for M. Phil. (Geology) (Semester System)

(To be effective from 2007 batch and onwards)

First Semester

Paper – I	Research Methodology	-	100 marks
Paper – II	Practical	-	100 marks
	Second Semester		
Paper – III	Developments in Geology	-	100 marks

Dissertation - 100 marks

Detailed Syllabus

SEMESTER -I

PAPER - I (Theory) Research Methodology 100 marks

Unit – I- 20 Marks

Paper - IV

Modal analysis, CIPW Norm and Niggli value calculation and their interpretation, Texture and structure of sedimentary rocks and their significance. Computation of mean, standard deviation, skewness and kurtosis. Basin analysis, Palaeocurrent analysis. ACF, AKF and AFM diagrams.

Unit – II - 20 Marks

Geochemical analysis of rocks and minerals with reference to SiO₂, Al₂O₃, K₂O, Na₂O, Fe₂O₃; Hydrogeochemical analysis with reference to Ca, Mg, TH, conductance, carbonate, bicarbonate, chloride, Sulphate; well drilling techniques – Percussion and Rotary.

Unit – III - 20 Marks

Structural analysis - π , β diagram and interpretation, Interpretation of satellite data and aerial photographs with reference to geomorphology, exploration of ore deposits and groundwater, Mechanics of fracturing in rocks, Mohr's diagrams and its interpretations.

Unit – IV - 20 Marks

Ore textures and microstructures, properties of ore minerals under reflecting microscope, Ore reserve calculation, Coal petrography, Proximate & ultimate analysis.

Unit – V - 20 Marks

DTA & X-Ray analysis of geological materials, Palynological studies, Petroliferous basins of India, Methods of analysis of elements by Atomic Absorption Spectrophotometer.

PAPER - II - Practical Related to Theory Paper - I - 100 Marks

SEMESTER - II

Paper – III (Theory) Developments in Geology

100 Marks

Unit – I 20 Marks

Ore deposition in space and time, Geochemical exploration of mineral deposits, Exploration of Chromite, Nickel, Gold and PGE in Orissa. Ore deposits related to plate tectonics.

Unit – II 20 Marks

Groundwater Pollution and its management, Management of coastal aquifers with special reference to Orissa, Concept of watershed and their management. Application of GIS and GPS in resource management. Land use and land cover analysis.

Unit – III 20 Marks

Seismic conditions in India, its zonation and management, Natural hazards and their management. Environmental pollution due to mining and mineral based industries and its mitigation.

Unit – IV 20 Marks

Evolution of life through ages, Application of micropalaeontology Foraminifera and their significance, Stratigraphy and structure of Singhbhum- Gangpur and Eastern Ghats belts, Energy Resources of India. Marine mineral resources of Indian Ocean.

Unit – V 20 Marks

Study of basalts, granitoids, alkaline rocks and anorthosite of Orissa, mineral changes in argillaceous and basic igneous rocks due to progressive regional metamorphism, Paired metamorphic belts, Study of Palaeocurrent and Provenance, Heavy mineral analysis, Least square method and Regression analysis of geological data.

Paper IV – Dissertation

100 Marks

A student is required to prepare a dissertation carrying 100 marks. He/She may start the dissertation Project in Consultation with his/her supervisor in the Ist Semester but the thesis will be submitted at the end of 2nd Semester. An External Examiner and the respective Supervisor will examine the Thesis.
