



**SCHOOL OF STUDIES IN EARTH SCIENCE
VIKRAM UNIVERSITY**

UJJAIN (M. P.) 456 010
(INDIA)

Ref. No. E. Sc./V. U./

Dated 31.07. 2013

To,
The Registrar (Acad)
Vikram University,
Ujjain

Subject: Submission of M. Phil - IInd Sem. Syllabus.

Sir,

Please find enclosed herewith the syllabus for
M. Phil II sem (Geology) as per new pattern.

The sem Ist and IIIrd has common curriculum
with the faculty (already available with
you).

Thanking you,

Yours sincerely

K N Singh 31.07.2013

(Dr K. N. Singh)

B. O. I. Chairman (Earth Science).

Encl: As above + B.Sc. scheme.

Paper – I

Research Methodology in Geology

(Marks – 100)

Unit – I

1. An overview of scientific hypothesis, model, theory and Philosophy of research methodology in context to Earth Sciences.
2. Selection and formulation of research problem and design.
3. Field methods in Geology: Scale, topographic map, Bearing and mapping.
4. Attitudes of the planar and linear features and their standard notations.

Unit – II

1. Methods of data collection. Primary and secondary data.
2. Observations and tests. Statistical techniques for processing and analysis of data.
3. Sampling - random sampling. Systematic/grid sampling: stratified and cluster sampling.
4. Sampling estimates – Central tendency parameters.

Unit – III

1. Microscopic techniques. Techniques in photomicrography.
2. Staining techniques for distinguishing Calcite-Dolomite.
3. Application of x-ray diffraction data in determination of composition.
4. NORM calculation and interpretation of ACF. AKF diagrams.

Unit – IV

1. Basic concepts of photo geology; methods and criteria for interpretation of aerial photographs.
2. Applications of aerial photographs in geological exploration.
3. Basic concepts of remote sensing techniques.
4. Applications of satellite imagery in geological, hydrogeological and mineral exploration.

Pramendra Kumar

20/11/13

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Paper – II
Applied Hydrogeology

(Marks – 100)

Unit – I

1. Concept of aquifers and determination of aquifer parameters.
2. Application and limitation of law of ground water flow.
3. Well hydraulics – steady and insteedy radial flow to wells, boundary effects.
4. Concept of leaky aquifers, image wells and hydraulics of open wells.

Unit – II

1. Type of wells and methods of water well drilling.
2. Design and construction of water well and tube wells.
3. Occurrence and potentials of ground water in various geologic provinces of India.
4. Water resource evaluation studies.

Unit – III

1. Ground water investigation – hydrogeological and geochemical surveys.
2. Geophysical method for ground water exploration.
3. Ground water development and management – water balance studies.
4. Environmental pollution studies of ground water.

Unit – IV

1. Study of aerial photographs and imaginaries and their significance in ground water investigations.
2. Application of geomorphology in ground water investigation.
3. Hydrogeologic studies of alluvial and basaltic terrains.
4. Hydro-geochemical analysis and interpretation of chemical quality of ground water.

Pranendra Kumar

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30/7/13

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Paper – III

Sedimentation and Related Mineral Deposits

(Marks – 100)

Unit – I

1. Origin of sediments, controlling factors of their formation and relative abundance of the common sediments in geologic time.
2. Particle size, shape and texture of detrital rocks.
3. Classification, mineralogy and petrogenesis of sandstones.
4. Primary and secondary structures of sedimentary rocks.

Unit – II

1. Dispersion of sediments as shown by mineral composition, shape and size of detrital grains.
2. Cyclic sedimentation, pattern and interpretation.
3. Sedimentation and mineral deposits with relation to the concept of plate tectonics.
4. Mineral deposits associated with chemical sedimentary rocks.

Unit – III

1. Mineral deposits of biochemical sedimentary nature.
2. Major coal forming epochs of the world and nature of coal seams in different types of basin.
3. Gondwanaland-palaeogeography and reconstruction.
4. Stratigraphy of Gondwana Supergroup in India and a brief correlation in other continents.

Unit – IV

1. Comparative study of Gondwana and Tertiary coals of India on the basis of process and product nature.
2. Petrography of Gondwana coals of India.
3. Classification, grade and quality of Gondwana coals of India.
4. Environmental impact assessment of coal mining activity.

Pramendra Singh

KSB
30/7/13

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