कोल्हान विश्वविद्यालय, चाईबासा

KOLHAN UNIVERSITY, CHAIBASA

University Department of

Geology

CBCS Syllabus of Under Graduate Course

(HONS)

(Semester System)

HEAD
University Department of Geology
Kolhan University, Chaibasa

Six Semester Course Under
Choice Based Credit System

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SEM –I
CORE COURSE GEOLOGY
PAPER -1 C C -1
EARTH SYSTEM SCIENCE
(CREDITS: THEORY -4)
FULL MARKS - 70

TTHEORY

LECTURES:

UNIT 1. Physical geology

- Geology and introduction to various branches of Geology
- Origin of the Solar System and its planets – Earth
- Origin,Size,shape,mass,density,rotational,revolution parameter and its age

UNIT 2. Interior of the earth

- Internal structure of the earth.
- Formation of core, mantle, crust, hydrosphere, atmosphere and biosphere.

UNIT 3. Plate tectonics

- Concept of Plate tectonics, seafloor spreading, and continental drift.
- Mid – Oceanic ridges, trenches, transform fault, rift valley and Island arcs
- Origin of ocean, continents and mountain isostrasy.

UNIT 4. Earth quake and volcano

- Earthquake and earthquake belt of India.
- Volcanoes and its type, products and distribution.

UNIT 5. Weathering of the rock.

- Rock weathering, Erosion and transportation.
- Geological – work done by wind, rivers, glaciers and oceanic current.
- Drainage and drainage pattern.
- Geomorphology.
- Soil formation, soil profile and soil types.

UNIT 6. Orogeny

- Orogeny and Neotectonics –Concept Orogeny and Neo-tectonics with examples.

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SUGGESTED READINGS

1. Holmes's Principles of Physical Geology, 1992, Chapman& Hall.
2. Emiliani, C1992, Planet Earth, Cosmology, Geology and the Evolution of life and Environment. Cambridge University Press
3. Text book of Geology – P.K. Mukherjee
4. Physical Geology –A.k. Dutta.

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SEM -I
CORE COURSE: GEOLOGY
PAPER –II CC-2
CRYSTALLOGRAPHY AND MINERALOGY
(CREDITS: THEORY -4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Crystallography

- Elementary ideas about crystal morphology in relation to internal structures: crystal forms, crystallographic axes and its orientation.
- Concept of Parameter system of Weiss and index system of Miller
- Laws of crystallography: Constancy of interfacial and, rational indices crystal symmetry
- Classification of crystal into six systems: study of symmetry elements and forms of the Normal classes.

UNIT 2: Mineralogy

- Minerals: Defamation and classification and physical properties of common rock forming minerals.
- Silicate Structures.
- Systematic Classication, Chemical Composition, Atomic structures and mode of occurrence of following Group of minerals : Olivine,Quartz,Felspar,Pyroxene,Amphibole,Garnet,Felspathoid and Mica

UNIT 3: Properties of light and Optical Mineralogy

- Nature of light and principles of optical mineralogy, Petrological microscope its parts and function.
- Optical characters of minerals, refractive index, twinning, pleochroism, Extinction angle, Interference color, Double refraction etc.
- Properties of common rock forming mineral in thin section.

SUGGESTED READINGS:

1. A text book of Mineralogy by Dana
2. P.F. Kerr 1959 Optical Mineralogy, MS Graw Hill
3. P.K. Verma 2009 Optical Mineralogy, CRC Press
4. Deer, W.A. Howei.R.A. and Aussman, J., 1996 An introduction to the rock forming minerals. Prentice –Hall
5. Rutley's elements of Mineralogy by H.H. Read.

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SEM -I
CORE COURSE: GEOLOGY
PRACTICAL PAPERS – CREDIT 4
FULL MARKS = 60

PRACTICAL

CC P- 1

- Plotting of contour maps and identification and description of important topographical features.
- Study of Topographic sheet::tracing of contours and drainage network.
- Study of Seismic Zones of India.(Earthquakes & Volcanoes).
- Crystal Projection: Clinographic Projection – Isometric System and Tetragonal System (Cube, Octahedran, Dodecahedran, Zircon and Prism and Pyramid of 1^{ST} and 2^{nd} order).
- Stereographic projection - Isometric System and Tetragonal System.
- Mohs' Scale of Hardness: Study and Documentation.
- Study of Physical properties of minerals in hand specimen: Olivine, Garnet, Kyanite, Beryl, Hornblende, Talc, Muscovite, Biotite, Quartz, Orthoclase, Plagioclase, Calcite, Quartz, Hematite, Magnetite, Chalcopyrite, Asbestos.
- Observation of following minerals under optical microscope and their characteristic properties: Quartz, Microcline, Plagioclase, Biotite, Muscovite, Hornblende, Augite, Hypersthenes, Olivine, Garnet.
- Practical Record and viva.

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SEM -II
CORE COURSE: GEOLOGY
PAPER –III C C- 3
ELEMENTS OF GEOCHEMISTRY AND ECONOMIC GEOLOGY
(CREDITS: THEORY -4)
FULL MARKS - 70

THEORY
LECTURES

UNIT 1: Concept of Geochemistry

- Introduction and Scope of Geochemistry
- General Concepts about geochemical cycles and mass balance.
- Geochemical Classification of elements.

UNIT 2: Earth Process and Resources

- Introduction to common rock forming, Ore forming and industrial minerals.
- Conventional and non-conventional energy resources :
  Coal, Petroleum, Atomic mineral, hot springs.
- Rock forming minerals – Silicates, Oxides and Sulfides, Chemical composition, Physical Properties, Systematic Classification.

UNIT 3: Economic Geology

- Ore forming Minerals ; Metallic and non – Metallic Process of formation of ores
- Magmatic Concentration, Hydrothermal Solution and Skarns, Secondary Enrichment, Sedimentation and a process of ore formation.
- Replacement and bacterial precipitation colloidal deposition.
- Weathering products and residual deposits oxidation and supergene enrichment.

UNIT 4: Indian distribution of important mineral

- Indian distribution of important mineral related to metals like Iron, Copper, Lead, Zinc, Aluminum, and non- metal related to refractory fertilizer, cement, gemstone, building stones.
- Methods of Mineral exploration, exploration and Processing.
- Environmental implication of exploitation of mineral resources. (Coal, Iron, Limestone etc.)

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SUGGESTED READINGS:

1. Manson,B (1986).Principles of Geochemistry.3rd Edition, Wiley New York
2. HoghRollinson (2007) Using geochemical data – evolution, presentation and interpretation.2nd Edition.Publishers Longman Scientific & Technical.
3. Walther John, V 2009 Essentials of Geochemistry, student edition. Jones and Bartlett Publishers.
4. Albarede.F 2003.An Introduction to Geochemistry. Cambridge University Press.

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SEM -II
CORE COURSE: GEOLOGY
PAPER –IV CC -4
PRINCIPLES OF STRUCTURAL GEOLOGY
(CREDITS: THEORY -4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Structures and Topography

- Basic concept of Bed and bedding plane, Dip and Strike.
- Effects of Topography on Structural Feature.
- Topographic and Structural Map.
- Importance of Scale of the map.

UNIT 2: Stress and Strain in Rocks

- Concept of Rock deformation: Stress and Strain in rocks, Strain ellipses of different types and their geological significance.

UNIT 3: Folds

- Fold Morphology, geometric and genetic classification of folds.
- Introduction to the mechanics of folding: Flexuralfold, Shear and flow folding.

UNIT 4: Foliation and Lineation

- Description. Origin and Classification of Foliation.
- Description and Origin of lineation and relationship with the major Structures.

UNIT5: Joints and Fault

- Defination types and classification of Joints, Faults and their reorganization in the field.
- Effects of faulting on the out crop.

UNIT 6: Unconformity

- Definitions, types of Unconformity and recognition of unconformities in the field.

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SUGGESTED READINGS:

1. Davis, GR.1984.Structural Geology of Rocks and Regio. John Wiley.
2. Billings, M.P. 1987.Structural Geology, 4thedition, prentice-Hall.
3. Park, R.G.200.Foundations of Structural Geology.Champan& Hall.
4. Pollard, D.D.2005.Fundamental of Structural Geology. Cambridge University press.
5. Ragan, D.M. 2009. Structural Geology: an introduction to geometrical techniques (4th Ed.) Cambridge University press (For Practical).

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SEM -II
CORE COURSE: GEOLOGY
PRACTICAL PAPERS
CREDIT - 4
FULL MARKS – 60

PRACTICAL

CC – P 2

- Identify the important rock forming minerals. (At least 10 minerals)
- Identify the important economic minerals. (At least 10 minerals)
- Show in the map of the map of India the deposits of Iron, Cu, Pb, Zn, Au, Radioactive minerals etc.
- Introduction to Geological maps: lithological and Structural maps.
- Drawing profile, sections and interpretation of Geological maps of different complexities: - Unconformities, Fold and Fault.
- Description of the Geological history of the map plotted.
- Solving 3-points problem of Dip and Strike.
- Drawing Structural Problems using Stereographic projection methods.
- Completion of the outcrop, showing different formations inside the ground, mentioning their depth.

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SEM: III
CORE COURSE GEOLOGY
PAPER –V C C -5
IGNEOUS PETROLOGY
(CREDITS: THEORY-4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Concepts of Igneous Petrology

- Introduction to Petrology.
- Defination of Igneous rock. Types of igneous rock.

UNIT 2: Classification and Texture

- Classication of Igneous rock.
- Forms of extrusive and intrusive rocks.
- Texture and structures of igneous rocks.

UNIT 3: Phase diagrams and magma geochemistry

- Phase diagram in understanding crystal-melt equilibrium, Uni component, biocomponent and Ternary Systems.
- Bowen's reaction series.
- Magmatic differentiation and assimilation.
- Magma generation in crust and mantle, their emplacement and eruption process.

SUGGESTED READINGS:

1. Principle of Igneous and Metamorphic Petrology by Anthony R.Philiphots and Jay, J.Ague.Second Edition, Cambridge University press.
2. An Introduction to Igneous and Metamorphic Petrology by John D.Winter Prentice Hall

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SEMESTER III
CORE COURSE GEOLOGY
PAPER VI C C- 6
SEDIMENTOLOGY
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Origin of Sediments

- Sedimentary rocks, Definition and Origin.
- Fluid flow and sediment transport: types of fluids, Laminar vs. turbulent flow, particle entrainment, transport and deposition.
- Sedimentary bed-forms, sediments gravity flows.

UNIT 2: Sedimentary Texture & Structure

- Sedimentary texture: Grain size scale, particle size distribution, Environmental connotation particle shape and fabric.
- Structure of Sedimentary Rocks: Primary and Secondary sedimentary structures.
- Basic concepts of Paleocurrent analysis.

UNIT 4: Varieties of sedimentary rocks

- Classification of sedimentary rocks.
- Petrographic description of Conglomerates, sandstones, mudrocks, limestone, dolomite, and bracia.

UNIT 5: Diagenesis and Lithification

- Concept of diagenesis.
- Stage of diagenesis: Compaction and cementation.
- Process of lithification.

SUGGESTED READINGS:

1. Prothero and Schwab, 2004, Sedimentary Geology, Freeman and Co. New York, 557p.
2. Maurice E. Tucker, 2006, Sedimentary Petrology, Blackwell Publishing, 262p.
3. Colinson J.D. and Thompsom D.B. 1988, Sedimentary structures, Unwin-Hyman London, 207p.

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SEMESTER III
CORE COURSE GEOLOGY
PAPER - VII CC-7
PALEONTOLOGY
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Fossilization and fossil record

- Introduction of fossil.
- Nature and importance of fossil record: Fossilization processes, modes of preservation and Use of fossils.
- Palynology and microfossils.
- Application of fossils in biostratigraphy, biozones, index fossils, correlation.
- Role of fossils in sequence stratigraphy.
- Fossils and palaeoenvironmental analysis.
- Trace fossils and their classifications.
- Application of ichnology in palaeoenvironmental reconstruction.

UNIT 2: Invertebrates and Vertebrates

- Morphology classification and geological history of following groups: Gastropoda, Brachiopoda, Mollusca, Arthropoda, Trilobites and Ammonoids.
- Origin of vertebrates.

SUGGESTED READING:

1. Raup D.M. & Stanley S.M.W.H. Freeman, 1971 Principles of Palaeontology.
2. Clarkson E.N.K. 2001 Invertebrate palaeontology and evolution 4th Edition by Blackwell.
3. Benton M.J. Blackwell, 2005, Vertebrate palaeontology.
4. Mishra & Shukal, 1982, Essentials of Palaeonbtany Vikas Publisher.
5. Armstrong H.A. and Brasier M.D., 2005, Microfossils Blackwell.

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SEM -III
CORE COURSE: GEOLOGY
PRACTICAL PAPERS
CREDIT 6
FULL MARKS –90

PRACTICALS
CC P3

- Study of various intrusive bodies.
- Megascopic study of important igneous rocks.
- Study of important igneous rocks in thin
- section:Granite,Granodiorite,Diorite,gabbro,anthositesm ultramafic rocks,basalt,andestes,teachyte,rhyolite,dacite,schists and amphibolites.
- Plotting of major and trace element data on binary and triangular diagrams
- Observation and documentation of important Sedimentary Structures.
- Study of sedimentary textures in hand specimen and thin section: Grain size and Shape.
- Identification of sedimentary rocks.
- Study of fossils showing various modes of preservation.
- Study of diagnostic morphological character, systematic position, stratigraphic position and age of various invertebrate, vertebrate and plant fossils.
- Drawing and labelling of important fossils.
- Field work and Practical report.

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SEMESTER IV
CORE COURSE GEOLOGY
PAPER - VIII C C-8
METAMORPHIC PETROLOGY
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY

LECTURES:

UNIT 1: Metamorphic rocks and Metamorphism

- Metamorphic rocks: Definition, Agents and Classification.
- Factor controlling metamorphism.
- Types of metamorphism: Contact, Regional, Fault zone metamorphism, Impact of metamorphism.

UNIT 2: Metamorphic Zone, Facies and Grades

- Index minerals.
- Metamorphic zones, Facies, Facies series and isograde.
- Mineralogical phase rule.
- Structure and Texture of metamorphic rocks.

UNIT 3: Metamorphism and Tectonism

- Relation between metamorphism and deformation.
- Metamorphic differentiation.
- Origin of migmatities.
- Metasomatism, Role of fluids in metamorphism.
- Evolution of Pelitic, Basic and Calcareous rock.

UNIT 5: Petrographic description:

- Petrographic description of Marble, Quartzite, Schists, Gneisses, Khondolites, Charnokites, Amphibolite and Eclogites.

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SUGGESTED READING:

1. Anthony R. Philphots and Jay J. Ague Principles of Igneous and Metamorphic Petrology Second Edition, Cambridge University Press.
2. John D. Winter, an Introduction to Igneous and Metamorphic Petrology, Prentice Hall.
3. Hugh Rollinson Using Geochemical Data: evaluation, presentation and interpretation Longman Scientific and Technical.
4. Loren A. Raymond, The study of Igneous, Sedimentary and Metamorphic rocks McGraw Hill.
5. Introduction to metamorphic petrology by B.W.D Yardley.

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SEMESTER IV
CORE COURSE GEOLOGY
PAPER - IX C C-9
INDIAN STRATIGRAPHY
(CREDITS: THEORY- 4)
FULL MARKS – 70

THEORY

LECTURES:

UNIT 1: Stratigraphy

- Understanding the past from the stratigraphic records.
- Introduction and Scope.
- Geological time scale.
- Principle of Stratigraphy, law of Superposition and fannual succession.

UNIT 2: Physiographic and Tectonic subdivision of India

- Brief introduction to the physiographic and tectonic subdivision of India.
- Introduction to Indian shield.
- Introduction to Proterozoic basins of India.
- Detail Geological study of Archean, Cudappah, Vindhyan, & Gondwana Successions of India.

UNIT 3: Palaeozoic - Mesozoic Succession of type areas

- Mesozoic stratigraphy of India:
  a) Triassic successions of Spiti.
  b) Jurassic of Kutch.
  c) Cretaceous succession of Cauvery basin.

UNIT 4: Volcanic provinces of India

a. Deccan Trap b. Rajmahal Trap

UNIT 5: A brief idea about stratigraphic of Jharkhand

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UNIT 7: Stratigraphic boundaries

- Important Stratigraphic boundaries in India.
  a) Precambrian-Cambrian boundary.
  b) Permian-Triassic boundary.
  c) Cretaceous-Tertiary boundary

SUGGESTED READINGS:

1. Krishnan M.S., 1982, Geology of India and Burma, CBS Publishers, Delhi.
1. Doyle P. & Bennett M.R. , 1996, Unlocking the Stratigraphic Record, John Wiley
2. Ramakrishnan M. & Vaidyanadhan R., 2008, Geology of India Volumes 1 & 2, Geological society of India, Bangalore.
3. Valdiya K.S., 2010, the making of India, Macmillan India Pvt. Ltd.

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SEMESTER IV
CORE COURSE GEOLOGY
PAPER - X CC -10
HYDROGEOLOGY
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Introduction and basic concepts of Hydrogeology

- Scope of hydrogeology and its societal relevance.
- Hydrological cycle: precipitation evapo-transpiration, runoff, infiltration, subsurface movement of water.
- Rock properties affecting groundwater.
- Vertical distribution of subsurface water.
- Types of aquifer, aquifer parameters, anisotropy and heterogeneity of aquifers.

UNIT 2: Groundwater flow

- Darcy's law and its validity.
- Intrinsic permeability and hydraulic conductivity.
- Groundwater flow rates and flow direction.
- Laminar and turbulent groundwater flow.

UNIT 3: Water Wells

- Test holes and well logs.
- Methods for constructing shallow and deep wells.
- Well completion and well development.

UNIT 4: Groundwater exploration

- Basic concepts: use of remote sensing and GIS in groundwater exploration.
- Surface based groundwater exploration methods.

UNIT 5: Geological formations as aquifers

- Groundwater occurrence in igneous, metamorphic and sedimentary rocks.
- Groundwater in non-indurated sediments.
- Groundwater provinces of India.

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UNIT 7: Groundwater management

- Surface and subsurface water interaction.
- Groundwater level fluctuations.
- Basic concepts of water balance studies, issues related to groundwater resources development and management.
- Rainwater harvesting and artificial recharge to groundwater.
- Basic concept of watershed management.

SUGGESTED READINGS:

1. Todd D.K., 2006, Groundwater hydrology, 2nd Ed., John Wiley & Sons, N.Y.
2. Davis S.N. and Weist R.J.M., 1966, Hydrogeology, John Wiley & Sons Inc., N.Y.
3. Karanth K.R., 1987, Groundwater Assessment, Development and management, TataMcGraw-Hill Pub. Co. Ltd.

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SEM -IV
CORE COURSE: GEOLOGY
PRACTICAL PAPERS
CREDIT - 6
FULL MARKS – 90

PRACTICALS

C C – P4

- Megascopic and microscopic study (texture and mineralogical) of the representative metamorphic rock
- Study of geological map of India and Jharkhand identification of major stratigraphic units.
- Exercise showing the major stratigraphic and tectonic units in outline map of India.
- Plot the different geological formation in the map of India.
- Plot the different Physiographic division in the map of India.
- Geological history and drawing of the profile of the topographical maps:-
- Identification of streams their order and stream patterns
- Study, preparation and analysis of hydrographs for different groundwater conditions.
- Water potential zones of India (map study).
- Draw the hydrogeologic cycle.
- Plotting the geological map and identification of stream order and their pattern.
- Preparation and interpretation of water level contour maps

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SEMESTER V
CORE COURSE GEOLOGY
PAPER - XI C C -11
ECONOMIC GEOLOGY & MINERAL EXPLORATION
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Ores and Gangues

- Ores and gangues mineral, tenor, grade and lodes.
- Resources and reserves: Defination.
- Modes of occurrence of Mineral deposits.
- Concept of ore genesis.
- Morphology of ore deposit, process involved.
- Concordant and discordant ore bodies.
- Endogenous processes – Magmatic concentration, contact metasomatism, hydrothermal deposit, cavity filling deposit.
- Exogenous processes – Chemical and bacterial precipitation, coliadal depositon, weathering products and residual deposits. Oxidation and supergene sulphide enrichment, placer deposits.

UNIT 2: Metalogenic province and epochs

- Metallic and non metallic ore, Oxide of Fe, Mn, Cr, Al and Sulphide of Cu, Pb, Zn.
- Mode of occurrences, chemical compositions, uses and distributions in India of the following: Ore of Fe, Al, Cu, Mn, Pb and Zn.

UNIT 3: Economic Mineral

- Principles of Mineral economics: Strategic, critical and essential mineral.
- Mineral production in India.
- Changing pattern of mineral consumption.
- National mineral policy.
- Mineral concession rules, marine mineral resources law Sea.
- Radio active minerals: mineralogy, geochemistry, detuction and measurement of radio activity.
- Prospecting techniques distribution in India.
- Radioactive well logging, nuclear waste disposal.

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UNIT 4: Mineral Exploration

- Surface and sub surface exploration methods including use of remote sensing techniques.
- Prospecting for economic minerals: drilling, sampling and assaying.
- Gravity electrica, magnetic, airborne methods of exploration.
- Geobotanical and geochemical methods of exploration.
- Environmental implication of exploitation of mineral resources: Coal, Iron, Limestone etc.

The course will also include discussions on topics determined by students in Tutorial. There would be 12 student presentations apart from the lectures. The topics would be assigned to students based on their interest

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SEMESTER V
CORE COURSE GEOLOGY
PAPER – XII C C-12
NATURAL ENVIORNMENT & GEOMORPHOLOGY
(CREDITS: THEORY- 4)
FULL MARKS - 70

UNIT 1: Concepts of disaster

- Concept and definition of environmental geology
- Concept of natural eco system on the earth and their mutual interrelations and interaction (atmosphere, hydrosphere and biosphere).

UNIT 2: Shifting of river course.

- Impact of soil cover.
- Impact of soil erosion.
- Land slide & floods.

UNIT 3: Geomorphology

- Defination of geomorphology and its scope and effect.
- Effect of geomorphology on the socio environment.
- Processes and landforms due to weathering, Glacier, River, (Fluvial) wind (Aeolin), Ocean and igneous activities.

UNIT 4: Endogenic and Exogenic interactions

- Rates of uplift and denudation.
- Drainage pattern and its development.

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SEM -V
CORE COURSE: GEOLOGY
PRACTICAL PAPERS
CREDIT - 4
FULL MARKS – 60

PRACTICAL

CC P - 5

1. Show the economical mineral deposit in the map of India.
2. Megascopic Identification: Study of Physical properties, Chemical Compositions, mode of occurrences and uses of of following minerals:-
    - Oxides: Magnetite, Hematite, Limonite, Chromite, Cassiterite.
    - Sulphides: Galena, Pyrite, Chalcopyrite.
3. Plotting of Importatant ores and other Economic Minerals in the map of India
4. Plotting the different of geo-hazards in the map of India
5. Reading topographic maps. Concept of Scale, Drainage pattern, types.
6. Laboratory exercise and practical records.

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SEMESTER VI
CORE COURSE GEOLOGY
PAPER - XIII C C-13
ENGINEERING GEOLOGY & ENERGY RESOURCES
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT 1: Engineering Geology

- Role of Engineering Geologist in planning, design and construction of major man - made structural features.
- Site investigation and Characterization and foundation treatment.
- Causes and corrective/preventive measures of landslides and Earthquake.
- Geological consideration in the location and construction of large dam, tunnel and reservoir.

UNIT 2: Energy resource – coal

- Geology of fuel:
- Definition and origin of coal.
- Stratigraphic types of coal.
- Fundamental of coal petrology.
- Types of coal: Peat, Lignite, Sub-bituminous, Bituminous and Anthracite.
- Indian coal deposits
- Coal deposits of Jharkhand.

UNIT 3: Petroleum

- Origin, migration of natural hydrocarbon.
- Source and reservoir rock.
- Structural, stratigraphic and mixed oil trapped.
- Exploration techniques: geophysical and geological.
- Onshore and Offshore distribution of petroliferous basins in India.

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SUGGESTED READINGS:

- Engineering Geology by Pravin Kumar Singh.
- A text book of Geology by P.K. Mukherjee.
- Introduction to Indian Coal deposite by L.N.Sharma & K.S. Ram

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SEMESTER VI
CORE COURSE GEOLOGY
PAPER - XIV C C -14
REMOTE SENSING, AERIAL PHOTOGRAPH & GIS
(CREDITS: THEORY- 4)
FULL MARKS - 70

THEORY
LECTURES:

UNIT1: Remote Sensing

- Introduction of remote sensing.
- Application of remote sensing techniques in planning of the large engineering structures and urban development.
- Use of remote sensing in mineral exploration.

UNIT2: Introduction to aerial photograph

- Introduction of Aerial photography
- Satellite imageries and preparation of photo geological map.
- Application of technique I n mapping the soil cover, forest cover, degraded land and surface water reserves.
- Use and interpretation of Aerial photographs.

UNIT3: GIS

- Defination, uses of GIS in the modern technology.

SUGGESTED READINGS:

1. Bell F.G., 1999, Geological Hazards, Routledge, London.
2. Bryant E., 1985, Natural Hazards, Cambridge University Press.
3. Smith K., 1992, Environmental Hazards, Routledge, London.
4. Subramanian V., 2001, Textbook in Environmental Science, Narosa International.

20/8/19

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SEM -VI
CORE COURSE: GEOLOGY
PRACTICAL PAPERS
CREDIT - 4
FULL MARKS – 60

PRACTICALS

CC P- 6

- Study of different types of coal.
- Borehole problems related to coal seams.
- To plot coal deposits in the map of India.
- To plot petroleum deposits in the map of India.
- Plotting of major Dam/Tunnels on the outline map of India.
- Plotting Seismic, Landslides Zones of India
- Aerial photo imaginary interpretation identification of Igneous, Sedimentary and Metamorphic rocks and Various Surface features.
- Field work and Practical records.

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