

## WAIKHOM MANI GIRLS' COLLEGE, THOUBAL

### PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES

PROGRAMME: BACHELOR OF SCIENCE

NAME OF DEPARTMENT: GEOLOGY

#### PROGRAMME SPECIFIC OUTCOME:

PSO1: Understand clearly the introduction of Geology, scope' sub –disciplines and relationship with other branches of sciences.

PSO2: Learn about origin and age of the Earth.

PSO3: Students are expected to briefly learn about formation ,classification and occurrence of minerals.

PSO4: Students are introduced about petrology(rocks),formation, composition ,classification and mode of origin etc.

PSO5: Learn about computer application in Geology.

PSO6: Students will have thorough understanding of various land forms formed by wind , rivers, glacier etc.

PSO7: Students will be acquainted with environmental hazards caused by rivers ,landslides volcanoes, earthquakes, cyclone etc.

PSO8: Learn about mining geology and engineering geology.

PSO9: Students also have the knowledge of historical geology.

PSO10: Students are expected to learn about hydrology, i.e action of groundwater , surface water.

### COURSE OUTCOMES

#### 1. FIRST SEMESTER

COURSE CODE: GEL 101

TITLE: General geology, Structural geology, and Geomorphology.

After completion of this course students will be able to understand

CO1: Origin ,size shape mass, density and internal constitutions of earth.

CO2: Origin of hydrosphere, atmosphere, biosphere, continents, ocean and mountains.

CO3: Application of radioactivity in determining the age of earth.

CO4: Causes, geological effects measurements and distributions of earthquakes.

CO5: Introduction, scope and objectives of structural geology.

CO6: Concepts of primary , secondary and miscellaneous structures found on the earth surface.

CO7: Identification, definition classification of fold, fault, joint and unconformity.

Co8: A detailed study of the geological work of natural agencies like groundwater rivers lakes wind etc.

CO9: Concepts and theory of Isostasy, Sea floor spreading, continental drift ,and plate tectonics .

Co10: Mitigation of environmental hazards like earthquake landslide and flood.

## 2. SECOND SEMESTER

COURSE CODE: GEL 202

TITLE: (Descriptive Mineralogy, Optical mineralogy, Crystallography and Geochemistry)

After completion of this course students will be able to learn

CO1: Identification, classification mode of occurrence, and genesis of minerals.

CO2: Study of physical chemical and optical properties of minerals.

CO3: Knowledge of reflection, refraction, total internal reflection and double refraction of minerals.

CO4: Nature of light, polarized light, and ordinary light.

CO5: Studies of optical properties of rock forming minerals like orthoclase, plagioclase, microcline, quartz etc.

CO6: Difference between crystalline and non-crystalline forms and their formation.

CO7: Bravais lattice and internal structures of crystal.

CO8: The seven crystal system and their thirty two classes.

CO9: Study of periodic table, crystal bonding, co-ordination number, radius ratios and solid solution.

CO10: Geochemical classification of elements, chemical and mineralogical phase rule.

## 3. THIRD SEMESTER

COURSE CODE: GEL303

TITLE: PETROLOGY ( Igneous rock, sedimentary rock and Metamorphic rock).

After completion of this course the students will understand

CO1: Forms, structure, texture, classification formation and composition of igneous rock.

CO2: crystallization of unicomponent and bicomponent system.

CO3: Brief petrographic , description and petrogenesis of common igneous rocks.

CO4: Sedimentary process, origin, transportation and deposition of sediments.

CO5: Difference between clastic and nonclastic sediments.

CO6: Brief study on environment of deposition.

CO7: Study of metamorphic rock –classification, texture, structure, nomenclature.

CO8: Common metamorphic rocks and their protoliths such as slate, quartzite, marble,etc.

CO9: Thermal and regional metamorphism in argillaceous, calcareous basic and ultrabasic rocks.

CO10: Phase rule and its application to H<sub>2</sub>O system.

#### 4. FOURTH SEMESTER

COURSE CODE :404

TITLE: PALEONTOLOGY AND STRATIGRAPHY,

After completion of this course the students will understand

CO1: Definition,its relationship with other sub disciplines of geology.

CO2: Various mode of preservation, collection of fossils.

CO3: Modern stratigraphic classification and geological time scale.

CO4: Indian stratigraphic code and nomenclature.

CO5: A detailed study of morphology and distribution of phylum such as mollusca brachiopods etc.

CO6: Study of evolution of horse man and elephant.

CO7: Classification of plant kingdom systematic position description stratigraphic significance of plant fossils.

CO8: Connotation of Archaean, Dharwar, Cuddapah, Gondwana and Deccan Plateau.

CO9: Lithology, tectonics and economic importance of Dharwar, Cuddapah, Vidhyan system.

CO10: Study of tertiary system of north- east India, Manipur .

## 5. FIFTH SEMESTER

PAPER CODE: GEL 505

TITLE: STRUCTURAL GEOLOGY, TECTONICS AND PETROLOGY.

After the completion of this course the students will be able to learn

CO1: Recognition of fold, faults in the fields.

CO2: Basic concepts of stress and strain and uses in structural geology .

CO3 : Concepts of plate tectonics and various structures associated with different plate boundaries.

CO4: Knowledge of phase equilibrium One,Two,Three component silicate system.

CO5: Elements of thermodynamics in magmatic crystallization.

CO6: IUGS mineralogical (QAPF) and chemical ( total alkali-silica diagram) classification schemes.

CO7: Graphical representation of mineral assemblages in ACF,A KF and AFM diagram.

CO8: Progressive metamorphism on Pelitic rocks, Basic rocks, calcareous rocks and ultramafic rocks.

CO9: Classification of rudaceous, arenaceous argillaceous and calcareous rocks.

CO10: Techniques of grain size analysis and graphical representation.

PAPER CODE: 506

TITLE: ECONOMIC GEOLOGY, MINERAL ECONOMICS, MINING AND EXPLORATION GEOLOGY.

CO1: Scope classification mineralisation and mineral deposits.

CO2: Brief idea about ore forming processes-magmatic, metasomatic, metamorphic ,hydrothermal placer and residual deposits.

CO3: Study of Indian deposits of minerals with reference to their geology, mode of occurrence, distribution and uses .

CO4: Study of industrial minerals of India-cement, ceramics, fertilizer, chemical, and building stones.

CO5: Significance of minerals in national economy, demands, supply, and substitution of minerals.

CO6: Origin, measures and stratigraphic of coal.

CO7: Surface indicators of petroleum, migration, its reservoirs, various types of oil traps, and onshore and offshore basin of India.

CO8: Concepts of mining methods-surface mining, alluvial mining, open cast mining and underground mining.

CO9: Fundamentals of geological geochemical and geophysical techniques employed in exploration of mineral deposits.

6SIXTH SEMESTER

PAPER CODE: GEL 608

TITLE: GEOPHYSICS, ENGINEERING GEOLOGY AND HYDROGEOLOGY.

After the completion of course students will be able to learn about

CO1: Role of geological and geophysical data in explaining geodynamical features of the earth.

CO2: General and exploration geophysics, different types of geophysical methods like magmatic, electrical and seismic, their principles and applications.

CO3; Application of geophysical methods in oil, gas, minerals and groundwater exploration.

CO4: Role of engineering geologists in planning, design and construction of major man made structural features.

CO5: Foundation treatment geological and geotechnical investigations for dams, reservoirs spillways tunnels, bridge, highways and shorelines.

CO6: Geological hazards, their significance causes preventive measures.

CO7: Recent trends in geotechnical engineering

CO8: Hydrological cycle and groundwater, origin, age of groundwater, and vertical distribution of groundwater.

Co9: Types of aquifers, water bearing properties of rocks.

CO10 : Groundwater provinces of India, dissolved constituents of groundwater.

PAPER CODE: GEL 609

TITLE: ENVIRONMENTAL GEOLOGY, QUATERNARY GEOLOGY, PHOTOGEOLOGY, REMOTE SENSING AND COMPUTER APPLICATION.

After the completion of this course the students will have the knowledge of

CO1: Fundamental concepts of environmental geology, hazards caused by river landslides volcanoes cyclone solid waste, radioactive waste.

CO2: Environmental impact of mineral development, recycling of resource, landuse planning in relation to engineering projects.

CO3: The character, duration and development of quaternary stratigraphy.

CO4: Quaternary dating methods-Radiocarbon, Uranium series, luminescence, Amino acid and related dating methods.

CO5: Applications of pollen, spores and polyoliths in quaternary stratigraphy.

CO6: Elements of airphoto interpretation, identification of sedimentary, igneous and metamorphic rocks.

CO7: Physical principles of remote sensing, earth resource satellite.

CO8: Characteristics and applications of imageries of LANDSAT 1 to 7, Indian remote sensing satellite mission.

CO9: Fundamentals of computer operating system, MS office word, excel, and powerpoint etc.

CO10: Applications of computer soft wares in geological science, GeoOrient and rockpack iii.