Chhindwara University, Chhindwara (M.P.)

SYLLABUS OF M.Sc. **GEOLOGY** SEMESTER - **III**

Name of Paper	Title of paper	Max.Marks			Minimum Marks			
		Theory	CCE	Practical	Theory	CCE	Practical	Total Marks
Paper- I	ORE GEOLOGY	40	10	-	15	4	-	50
Paper- II	MINERAL EXPLORATION	40	10	-	15	4	-	50
Paper- III	PHOTO GEOLOGY AND REMOTE SENSING	40	10	-	15	4	-	50
Paper- IV	ENGINEERING GEOLOGY	40	10	-	15	4	-	50
PRACTICAL – I	PHOTOGELOGY, REMOTESING AND ENGINEERING	-	-	50	-	-	20	50
PRACTICAL – II	PHOTOGELOGY, REMOTESING AND ENGINEERING ORE GEOLOGY AND MINERAL EXPLORATION	-	-	50	-	-	20	50

oard of Studies :

I. Chairman – 16.2.2020

II. Subject Expert –

1. Dr. M.L. PAKHALE
2. Dr. K.R. RANDIVE 16.02.2020
3. Dr. H.W. KHANDARE 16/2/20

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	FIRST
TITLE	:	ORE GEOLOGY
MAX. MARKS	:	40

UNIT- I Relation of magma to mineral deposits. Geological thermometers. Ore genesis. Control of ore deposits. Paragenesis and zoning in mineral deposits. Classification of mineral forming processing.

UNIT-II Processes of Mineral deposits : Magmatic concentration, Hydrothermal and Volcano-genetic deposits. metasomatism

UNIT-III Processes of Mineral Deposits -sublimation, pegmatite, contact metamorphism, metasomatism, Hydrothermalcarbonatite Sedimentary, Placer and Residual. Oxidation and Supergene Enrichment. Ore Microscopy : Textures and Structures of Ore.

UNIT-IV origin, mode of occurrence, association, uses and Indian occurrences of the ores of Iron, Manganese, Chromium, Copper, Lead, Zinc, Aluminum and Gold, tin tungsten, Titanium berylliummolybdenum, & silver.

UNIT-V Origin, Mode of Occurrence, Association, Specification and Grade for users in Industries and India distribution for non metallic minerals uses in Industries. Minerals used in Fertilizers and Cement Industries. Mica, asbestos barite, graphite. Mineral resources of MP and conservation of minerals

SUGGESTED READINGS :

- Bateman, 1981 : Economic Mineral Deposits, Wiley.
- Deb, S. Industrial Minerals.
- Evans, J.M. 1993 : Ore Geology and Industrial Minerals, Blackwell.
- Krishnaswamy : Mineral Resource of India.
- Lamey, Carl, A : Ashok, 2000 : Ore Genesis – a holistic approach, Allied P.
- Mookherjee, 1999 : Ore Petrology, McGraw Hills
- Umeshwar Prasad, 2000 : Economic Geology, CBS

Board of Stadies –

1- Chairman –Prof. Arun K. Shandilya 16/2/20
2- Subject Expert –
   I. Prof. M.L. Pakhale –
   II. Prof. K.R. Randive 16.02.2020
   III. Prof . H. W. Khandare

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	SECOND
TITLE	:	MINERAL EXPLORATION
MAX. MARKS	:	40

UNIT- 1 Geological exploration, mode of occurrence of commercial grade deposit of ore, Geological criteria, Ore Guides for mineral prospecting. Methods of geological : exploratory grids, pits, trenches. Well logging in evaluation of deposits .

UNIT-II Sampling methods and Assaying by channel sampling methods, placer sampling, under ground mining sampling Calculation of ore reserve and classification of ore deposits

UNIT-III Classification and principles of geophysical methods : Electrical methods , instrument used in electrical prospecting. Application in mineral prospecting, magnetic method, magnetic properties of rock and minerals, megnetometer. Type of electromagnetic radiation/Spectrum (EMR) Energy used in remote sensing Sensor plat form, Energy interaction with earth surface and atmosphere

Unit – IV Gravity methods : Earth's gravity fields, regional and local gravity anomalies. Pendulumtorsion balance of gravimeters, Interpretation of gravity anomalies for mineral deposits. Seismic methods: Elastic properties of rocks, types of elastic waves (P,S,L waves), Refraction and reflection methods, time-distance relation for horizontal interface, seismic instruments- geophones.

Unit – V Geochemical Exploration : Geochemical cycle mobility of elements, path finder elements, mode of occurrence of trace elements, primary dispersion patterns of deep seated origin, syngenetic and epigenetic diffusion. Sampling technique for geochemical exploration.

SUGGESTED READINGS :

- Arogyaswamy, R.N.P., 1996 : Courses in Mining Geology. IV ed, Oxford/ IBH.
- Dobrin, M.B. 1976 : Intrioduction to Geophysical Prospectiog, Pergamon London.
- Ginzburg, I.I. : Principles of Geochemical Prospecting, Pergamon London. Hawkes, H. and Wobb, J.S. : Geochemical in Mineral Exploration, Harper NY
- Holson, G.D. and Tiratsoo, E.N., 1985 Introduction to Peroleum Geology, GulfPubl.
- Howel C.H. : Introduction to Geophysics.
- Milton and Dobrin : Introduction to Geophysical Prospecting McGraw Hill
- Parasia, D.S. : Principles of Applied Geophysics.

Board of Stadies –

1- **Chairman –Prof. Arun K. Shandilya** 16.2.2020

2- **Subject Expert –**

I. **Prof. M.L. Pakhale**

II. **Prof. K.R. Randive** 16.02.2020

III. **Prof . H. W. Khandare**

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	THREE
TITLE	:	PHOTO GEOLOGY AND REMOTE SENSING
MAX. MARKS	:	40

UNIT - I Introduction to aerial photography. Types of aerial photos. Geometric principles of photographs- relief and tilt displacement, Vertical Exaggeration and distortions. Measurements form Aerial Photographs: Scales, Distance, Area and Height.

UNIT- II Preparation of Photo-geologic Maps. Mosaic controlling factors of aerial photograph, scale flight plan, area, purpose, time and season of photography. Introduction to overlap, sidelap, drift, crab, fiducial marks. Elements of interpretation of aerial photographs. Back ground knowledge, factor affecting aerial photography.

UNIT-III Types of Electro-Magnetic Spectrum. Space platforms. Reflectance of Minerals, vegetation, rocks and water. Elementary idea about active passive sensors Introduction to IRS mission.

UNIT-IV Multi Spectral Scanner(MSS), SLAR, SAR, LISS, camera, Thermal infrared line scanner (TIRLs), near infrared (NIR), microwave (Radar)Imagery. Introduction to image processing, continuous image processing, discrete image processing system.

UNIT-V Application of Photo Geology and Remote Sensing, in the study of Geomorphology, Lithology and Structural Features and Hydrogeologic studies.

SUGGESTED READINGS:

- Curra, P.J., 1985 : Principles of Remote Sensing, ELBS/Longman
- Drury, S.A., 1987 : Image Interpretation in Geology, Allen and Unwin.
- Lend, D.R. : Principales and Interpretation of Aerial Photographs.
- Miller, V.C., 1961 Photo Geology, McGraw
- Pandey, S.N., 2001 : Principles and Applications of Photo Geology, New Age.
- Parry S. Seigal and Alan R : Remote Sensing in Geology.
- Patel, A.N. and Surendra Singh : Principle of Remote Sensing,Scientific Publisters
- Pratt, V.K. : Digital Image Processing.
- Tripathi and Bajpai ed. 2000 : Remote Sensing in Geosciences.
- Wolf : Introduction to Photogrammetry.
- Jenson : Environmental Remote Sensing

Board of Stadies –

1- **Chairman –Prof. Arun K. Shandilya** 16.2.20

2- **Subject Expert –**

I. **Prof. M.L. Pakhale**

II. **Prof. K.R. Randive**

III. **Prof . H. W. Khandare**

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	FOUR
TITLE	:	ENGINEERING GEOLOGY
MAX. MARKS	:	40

UNIT-I Importance of geologyin civil engineering, Merits and Demerits of civil engineering in folds, faults and joints affected area. Engineering properties of rocks.

UNIT-II engineering properties test,of rocks, used as foundation site Building stone, aggregates and ballast.

UNIT-III Dam and its Parts. Types of dam. Geological consideration for the selection of dam site and Reservoir. Related to failure of Dams. Grouting, water tightness and influencing factors, silting, desilting of Reservoir. Major dams of India. Geological consideration in major engineering projects.

UNIT-IV Bridge: Types and Geological considerations. canals : Geological considerations and lining. Tunnel : Terminology and Types, Geological Considerations for Tunneling in different Grounds. Lining of Tunnels. Highways Geological considerations for construction of highways.

UNIT-V Landslide : Causes, Effects and Prevention. Consideration of civil engineering in seismic areas. Geo-hazards : Mitigation and Management.

SUGGESTED READINGS :

- Bell, F.G., 1999 : Geological Hazards, Rout ledge.
- Blyth, F.C.H. : Geology for Engineers, Arnold Ltd.
- Kesavulu, N.C. : Text Book of Engineering Geology, McMillan.
- Khurmi, R.S. : Fundamental of Engineering Geology, Dhanpat Rai & Sons.
- Krynine and Judd, W.R. : Principles of Engineering Geology andj Geotechnics, McGraw
- Parbin Singh : EngineeringandGeneral Geology, Katson Publ House.
- Ramnathan, R.M. : Engineering Geology, Anuradha Agency, T.N.
- Richey, J.E. : Elements of Engineeringj Geology, Sir Issac Pitman &Sons.
- Sumit, K. 1992 : Environmental Hazards, Rout ledge. Trefethe, N.C. : T.B. of Geology and Engineering Geology, McMillan.

Board of Stadies –

1- Chairman –Prof. Arun K. Shandilya 16.2.20

2- Subject Expert –

I. Prof. M.L. Pakhale

II. Prof. K.R. Randive 16.02.2020

III. Prof . H. W. Khandare

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	PRACTICAL-1
TITLE GEOLOGY	:	PHOTOGELOGY, REMOTESING AND ENGINEERING
MAX. MARKS	:	50

Board of Stadies –

1- Chairman –Prof. Arun K. Shandilya

2- Subject Expert –

I. Prof. M.L. Pakhale

II. Prof. K.R. Randive

III. Prof . H. W. Khandare

CHHINDWARA UNIVERSITY, CHHINDWARA(M.P.)

Session-2020-2021

CLASS	:	M. Sc.
SEMESTER	:	THIRD
SUBJECT	:	GEOLOGY
PAPER NO.	:	PRACTICAL-1
TITLE GEOLOGY	:	PHOTOGELOGY, REMOTESING AND ENGINEERING
MAX. MARKS	:	50

Session-2020-2021

PAPER NO.	:	PRACTICAL-2
TITLE	:	ORE GEOLOGY AND MINERAL EXPLORATION
MAX. MARKS	:	50

Board of Stadies –

1- Chairman –Prof. Arun K. Shandilya
2- Subject Expert –
   I. Prof. M.L. Pakhale
   II. Prof. K.R. Randive
   III. Prof . H. W. Khandare

16.02.2020