

**SCHOOL OF STUDIES IN GEOLOGY AND  
WATER RESOURCE MANAGEMENT**  
PT. RAVISHANKAR SHUKLA UNIVERSITY, RAIPUR, CHHATTISGARH.

2017-2018

**P. G. DIPLOMA IN REMOTE SENSING AND  
GEOGRAPHIC INFORMATION SYSTEM**

**SCHEME OF EXAMINATION**

**THEORY**

	Max. Marks
Course – I Principles of Geology and Geomorphology	100
Course – II Introduction to GIS and Tools for Map Analysis	100
Course – III Principles of Remote Sensing and Information Extraction from Images	100
<b>Aggregate Theory (A)</b>	<b>300</b>

**PRACTICAL**

Lab Course – I Comprise exercises related to Course – I	50
Lab Course – II Comprises exercises related Courses II & III	100
<b>Aggregate Practical (B)</b>	<b>150</b>

**Project Oriented Dissertation**

(Related with any one of the following subjects/disciplines:  
Geology/Geomorphology/Forestry/Agriculture/Town & Country Planning)

Script Evaluation	100
Seminar	25
Viva-voce	25
<b>Total</b>	<b>150.</b>

**GRAND TOTAL** **600**

## SYLLABUS

### Course – I Principles of Geology and Geomorphology

#### Unit- I

1. Earth in the Solar system. Surface features and internal structure of the Earth.
2. Minerals – Definition, Classification, Physical properties and chemical composition.
3. Rocks – Definition, Classification, Mineral composition and texture of important Igneous,
4. Definition, Classification and texture of important sedimentary and metamorphic rocks.

#### Unit – II

1. Definition and classification of economic Minerals.
2. Mode of occurrence and distribution of Iron, manganese, Copper, Lead –Zinc deposits in India.
3. Mode of occurrence and distribution of fossil fuels in India.
4. Mode of occurrence and distribution of Industrial minerals in India.

#### Unit- III

1. Rock weathering and soil formation. Important soil types of India.
2. Concept of bedding and deformation in rocks. Elementary idea of attitudes in rocks.
3. Folds – elements and classification. Foliation and Lineation in rocks.
4. Faults and joints \_ elements and classification. Unconformities.

#### Unit –IV

1. Distribution of continents and oceans. Origin of mountains.
2. Earthquakes and Volcanoes, their distribution. Volcanic landforms.
3. Wave erosion and beach processes. Coastal landforms.
4. Erosion and deposition by winds. Aeolian landforms , their characters and distribution in India.

#### Unit – V

1. Erosion and deposition by rivers. Drainage pattern.
2. Characteristics of fluvial landforms.
3. Glacial landforms, U - shaped valleys, moraines.
4. Karstification and karst landforms. Solution valleys, caves, stalactites and stalagmites.

## **Course- II Introduction to GIS and Tools for Map Analysis**

### Unit – I

1. Concept of GIS – Historical background. Uses of GIS.
2. Objectives, elements and applications of GIS.
3. Data source. Concept of space and time in spatial information. Geoinformatics.
4. Fundamentals of computers – generations, components, software and hardware.

### Unit – II

1. Major types of software – Programming languages. Computer operating systems.
2. Application software for computers. Sources of GIS and Remote sensing software.
3. GIS data models. Characteristics of spatial data – Raster and Vector models and their advantages and disadvantages.
4. Fundamentals of Internet. Internet GIS.

### Unit – III

1. Data input methods – Spatial data input: digitization. Attribute input.
2. Map and its utility. Presenting Geographic information through layers.
3. GIS data formats. GIS data entry. Sources of GIS data error.
4. Features in topographic base map. Base map accuracy standards.

### Unit- IV

1. Data display. Digital Elevation Model. Visualizing surfaces with TIN layer.
2. Data quality. Metadata. Data analysis and editing.
3. Topology and topology creation.
4. Global positioning systems – segments, receivers. Applications and limitations.

### Unit – V

1. Fundamentals of cartography. Principles of computer cartography.
2. Cartographic models. Digital cartography and GIS. Map symbols.
3. MapInfo Tutorials.
4. GIS Project design and management.

## **Course – III Principles of Remote sensing and information extraction from Images.**

### Unit – I

1. Concept of Remote Sensing. Electromagnetic radiation and their properties – Reflection, emission and adsorption of EMR.
2. Interaction of earth surface features with EMR. Effects of Atmosphere on EMR.
3. Physical basis of Remote Sensing. Types of satellites.
4. Basic principles of thermal Remote Sensing.

### Unit – II

1. Basic principles of microwave Remote Sensing. Uses and advantages of Radar imagery.
2. Data acquisition. Remote Sensing platforms and sensors.
3. Data products, their characteristics and uses.
4. Data interpretation: Visual and computer aided interpretation techniques. Digital image processing.

### Unit – III

1. Fundamentals of Aerial photography.
2. Concept of Photogrammetry. Stereoscopic vision.
3. Height and slope rectification of aerial photographs.
4. Interpretation of aerial photographs.

### Unit- IV

Applications of Remote Sensing in:

1. Lithological discrimination.
2. Mineral exploration.
3. Geomorphology.
4. Site selection for Engineering Projects.

### Unit –V

Applications of Remote Sensing in:

1. Hydrogeology
2. Land use and land cover.
3. Urban Planning.
4. Forestry.