NAAC Accredited Grade A+, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)
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DEPARTMENT OF GEOLOGY

COURSE CURRICULUM & MARKING SCHEME

M.Sc. I and II Semester

GEOLOGY

(Based on Choice Based Credit System)

SESSION : 2025-26

ESTD: 1958

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, 491001 (C.G.)

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025-26

M.Sc. Geology programme renders insight on the Earth Systems Sciences and its relationship with other branches of science leading to development of basic observational skill to become prominent geoscientist. Students will develop their critical thinking skills, application to solve the geological problems using scientific methods. Training under this program will enhance the ability of the students to acquire, analyze and communicate their ideas, scientific data and interpretation to the users. The programme equips them for competing in different national level examinations.

Approved syllabus for M.Sc. Geology by the members of Board of Studies for the Session 2025-26 , the syllabus with the paper combinations is as under: -

Semester I:

Paper I : Advance Geomorphology **Course code:- MGL 101**	**Paper II :** Advance Structural Geology and Tectonics **Course code:- MGL 102**
Paper III: Advance Mineralogy and Crystallography **Course code:- MGL 103**	**Paper IV:** Geochemistry, Instrumentation and Analytical Techniques **Course code:- MGL 104**
Practical: Lab Course I **Course code:- MGLP01**	**Practical: Lab Course II** **Course code:- MGLP02**

Semester II:

Paper I: Igneous Petrology **Course code:- MGL 201**	**Paper II:** Sedimentology **Course code:- MGL 202**
Paper III: Metamorphic Petrology **Course code:- MGL 203**	**Paper IV:** Palaeobiology and Stratigraphy **Course code:- MGL 204**
Practical: Lab Course I **Course code:- MGLP03**	**Practical: Lab Course II** **Course code:- MGLP04**
Field work/Report + viva - 100 **Course code:- MGLP05**	

*** Field Work/ Project work (In lieu of theory papers) –**

{Project oriented Dissertation - 50 marks +Viva on Dissertation - 50 marks} Total 100 Marks

The syllabus for M.Sc. Geology is hereby approved for the session 2025 -26.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

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Program Outcomes of M.Sc. Geology.

PO1: Knowledge: Acquire an overview of concepts, fundamentals and advancements of science across a range of fields, with in-depth knowledge in at least one area of study. Develop focused field knowledge and amalgamate knowledge across different disciplines.

PO2: Complementary skills: Students will be able to engage in critical investigation through principal approaches or methods and through effective information search and employ highly developed conceptual, analytical, quantitative and technical skills and are adept with a range of technologies

PO3: Applied learning: Students will be able to apply disciplinary or interdisciplinary learning across multiple contexts, integrating knowledge and practice. Recognize the need for information; effectively search for, evaluate, manage and apply that information in support of scientific investigation or scholarly debate.

PO4: Communication: Communicate effectively on scientific achievements, basic concepts and recent developments with experts and with society at large. Able to comprehend and write reports, documents, make effective presentation by oral and/or written form.

PO5: Problem solving: Investigate, design and apply appropriate methods to solve problems in science, mathematics, technology and/or engineering.

PO6: Environment and sustainability: Understand the impact of the solutions in ethical, societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.

PO7: Teamwork, collaborative and management skills: Recognize the opportunities and contribute positively in collaborative scientific work. Engage in intellectual exchange of ideas with other disciplines.

Program Specific Outcomes of M.Sc. Geology

The student graduating with the M.Sc. Geology will be able to

1. Acquire fundamental/systematic or coherent understanding of the academic field of Geology, its different learning areas
2. Demonstrate the ability to use skills in Geology and its related areas of technology for formulating and tackling geosciences-related problems and identifying and applying appropriate geological principles and methodologies to solve a wide range of problems associated with geosciences.
3. Demonstrate competencies related to problem-solving skills that are required to solve different types of geosciences-related problems and investigative skills, including skills of independent investigation of geosciences-related issues and problems;
4. Develop Communication skills and analytical skills ability to work both independently and in Teams involving the ability to read texts and research papers analytically and to present information in a concise manner.

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Syllabus and Marking Scheme for First Semester

Paper No.	Title of the Paper	Marks Allotted in Theory		Marks Allotted in Internal Assessment		Credits
		Max	Min	Max.	Min.	
I	Advance Geomorphology	80	16	20	04	05
II	Advance Structural Geology and Tectonics	80	16	20	04	05
III	Advance Mineralogy and Crystallography	80	16	20	04	05
IV	Geochemistry, Instrumentation and Analytical Techniques	80	16	20	04	05
V	Lab Course I	100	36			04
IV	Lab Course II	100	36			04
	Total	**520**		**80**		**28**

04 Theory papers - 320
04 Internal Assessments - 80
02 Practical - 200
Total Marks - 600

Note: 20 marks = 01 credit in Theory Papers and 25 Marks = 01 Credit in Practical/Project work.

GENERAL INSTRUCTIONS FOR STUDENTS

1. The candidate has to obtain minimum 20% marks in each theory paper and internal assessment separately.
2. The candidate has to secure minimum 36% marks as an aggregate in order to pass that semester examination.
3. The internal assessment shall include class test, home assignment and seminar presentation.

Course Outcome Paper I: Geomorphology

On completion of Course, the students will be able to

1. Describe the fundamental concepts of Geomorphology, Weathering, Soil processes and Geomorphic regions of India, Coastal landforms.
2. Identify and describe the landforms formed by the volcanoes, tectonic activities and the geological work done by a river and Karst Topography.
3. Describe the geological work done by the wind and glacial processes.
4. Analyze the drainage patterns using morphometric analysis and apply the principles of geomorphology in various domains.

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DETAILS OF SYLLABUS

FIRST SEMESTER

Course Code:- MGL 101, Paper I: Advance Geomorphology

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Concepts of Geomorphology, weathering processes, cycle of erosion.
(ii) Landforms in relation to climate, rock type, structure & tectonics.
(iii) Geomorphic regions of India. Rock weathering and soil formation.
(iv) Hypsography of the continents and ocean floor- Continental shelf, slope, rise and abyssal plains.
(v) Coastal landforms.

Unit 2. (i) Fluvial landforms: Erosional and depositional landforms formed due to fluvial action.
(ii) Karst landforms. Erosional landforms formed due to the action of underground water.
(iii) Karst landforms. Depositional landforms formed due to the action of underground water.
(iv) Volcanoes- Their form & structure, Types, Volcanic products.
(v) Volcanic landforms, volcanic belts of the world.

Unit 3. (i) Aeolian landforms: Erosional landforms formed due to the action of wind.
(ii) Aeolian landforms: Depositional landforms formed due to the action of wind.
(iii) Glacial landforms Erosional landforms formed due to glacial action.
(iv) Glacial landforms: Depositional landforms formed due to glacial action.
(v) Ice Age and its causes.

Unit 4. (i) Morphometric Analysis, slope analysis, stream ordering, Bifurcation ratio, stream frequency, drainage density.
(ii) Applied Geomorphology meaning and concept.
(iii) Geomorphology and hazard management.
(iv) Geomorphology and engineering works.
(v) Geomorphology and mineral exploration.

Chairperson /H.O.D Subject Expert Subject Expert Subject Expert

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FIRST SEMESTER
Paper I: Advance Geomorphology

Books Recommended

Thornbury, W.D., 1986: Principles of Geomorphology. John Wiley.
Singh, Savindra, 2007: Geomorphology. Prayag Pustak Bhavan, Allahabad.

Question Paper Format and Distribution of Marks for PG Semester Examination

Question paper format for the Post-Graduate Examination has been revised from the Session 2018-19. The revised format will be applicable for all the question papers of Semester I, II, III & IV. The following are the main points of the new format:

1. The question paper will be of **80 marks** (as before)
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows:
   - Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
   - Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
   - Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**
   - Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note:

1. Question no. 1 and Question 2 will be compulsory.
2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.
3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit. Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the Syllabus/syllabi.

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Senior Professor of Science Faculty | Departmental members | Alumnus | Student

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4.Internal Assessment Examination will be as follows:

i. Internal Test in each paper. (20 marks)

ii. Seminar (Power point presentation) in any one of the paper. (20 marks)

iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)

iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

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Course Outcome Paper II: Advance Structural Geology and Tectonics

On completion of Course, the students will be able to

1. Understand and assess stress acting on a rock during deformation. Identify, classify and compare various types of folds.
2. Classify and describe faults, joints and unconformities and conclude about the mechanics of their formation.
3. Demonstrate the ability to judge the order of superposition of rock beds. Identify, classify, interpret and compare planer and linear fabric in rocks. Construct and interpret geological maps and π and β diagrams.
4. Summarize the theory of plate tectonics and explain the evolution of continental and oceanic crust and anatomy of Precambrian orogenic belts of India.

FIRST SEMESTER
Paper II: Advance Structural Geology and Tectonics

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Mechanical principles of rocks and their controlling factors. Concept of stress and strain and theory of rock failure. Role of fluids in deformation processes.
(ii) Stress analysis: Compressive and shear stress, biaxial and triaxial stress, Mohr's circle and envelope. Two-dimensional stress and strain analyses. Types of stress and strain ellipsoids, their properties and geological significance.
(iii) Folds, their description and classification. Causes and mechanics of folding and buckling.
(iv) Fold development and distribution of strains in folds.

Unit 2. (i) Elements, terminology and classification of faults.
(ii) Causes and mechanics of faulting. Strike slip fault, normal fault, over thrust and nappe structure.
(iii) Causes and mechanics of faulting. Strike slip fault, normal fault, over thrust and nappe structure. Fractures and joints, their nomenclature, classification, origin and significance.
(iv) Unconformities, types and significance.

Unit 3. (i) Top and bottom criteria (order of superposition of rock beds) using primary and secondary structures.
(ii) Planar and linear fabrics in deformed rock, their origin and significance.
(iii) Field techniques of lithological and structural mapping.
(iv) Significance and limitations of π and β diagrams.

Unit 4. (i) Concept of continental drift and plate tectonics and recent advances.
(ii) Isostacy, Sea Floor spreading , paleomagnetism, polar wandering,
(iii)Tectonics of precambrian orogenic belts of India.
(iv) Formation of mountain roots and Anatomy of orogenic belts.

Chairperson /H.O.D Subject Expert Subject Expert Subject Expert

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Books Recommended

Ramsay, J.G., 1967: Folding and Fracturing of Rocks. McGraw Hill.

Hobbs, B.E., Means, W.D. and Williams, P.F., 1976: An Outline of Structural Geology, John Wiley.

Davis, G.R., 1984: Structural Geology of Rocks and Region. John Wiley.

Ramsay, J.G. and Huber, M.I., 1987: Modern Structural Geology, Vol. I and II Academic Press.

Ghosh , S.K.,1995: Structural Geology Fundamentals of Modern Developments. Pergamon Press.

Billings, M.P., Structural Geology

Moores, E. and Twiss, R.J., 1995: Tectonics. Freeman.

Valdiya, K.S.,1998: Dynamic Himalaya. Universities Press, Hyderabad.

Summerfield, M.A., 2000: Geomorphology and Global Tectonics. Springer Verlag.

Question Paper Format and Distribution of Marks for PG Semester Examination

Question paper format for the Post-Graduate Examination has been revised from the Session 2018-19. The revised format will be applicable for all the question papers of Semester I, II, III & IV. The following are the main points of the new format:

1. The question paper will be of **80 marks** (as before)
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows :

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**

Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note :- 1. Question no. 1 and Question 2 will be compulsory.

2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.
3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.

Chairperson /H.O.D Subject Expert Subject Expert Subject Expert

Senior Professor of Science Faculty Departmental members Alumnus Student

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M.Sc. Geology 2025-26

4. Internal Assessment Examination will be as follows :
   i. Internal Test in each paper. (20 marks)
   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)
   iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

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Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
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M.Sc. Geology 2025-26

Course Outcome Paper III: Advance Mineralogy and Crystallography

At the end of the course, the students will be able to

1. Identify and classify the rock-forming minerals on the basis of their physical and optical properties and discuss the construction and working of Quartz wedge, Gypsum plate and Mica plate.
2. Determine the optical characters, order of interference color and pleochroic scheme of minerals.
3. Discuss the symmetry characteristics and forms of various crystal systems.
4. Categorize and describe the properties of rock forming silicates and gemstones.

FIRST SEMESTER

Paper- III Advance Mineralogy and Crystallography

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Minerals and their classification.
(ii) Physical and optical properties of minerals.
(iii) Refractrometry and its determination. Uniaxial and Biaxial indicatrics.
(iv) Dispersion in minerals, optic orientation, optical anomalies.
(v) Optical accessories: Quartz wedge, Gypsum plate and Mica plate.

Unit 2. (i) Determination of order of interfenece colour and pleochroic scheme of minerals.
(ii) Optical characters of Uniaxial and Biaxial minerals.
(iii) Morphology of crystals. Fundamental laws of crystal Zones and Zonal symbols.
(iv) Classification of crystals in 32 classes.
(v) Symmetry and forms of crystals of Isometric, Tetragonal, Hexagonal systems.

Unit 3. (i) Symmetry and forms of crystals of orthorhombic, monoclinic and triclinic systems.
(ii) Crystal aggregates- Twinning. Irregularities and imperfection in crystals.
(iii) Classification of silicate structure.
(iv) Systematic mineralogy (atomic structure, mineral chemistry and their P-T stability and mode of occurrence of Nesosilicates – Olivine, Garnet, Topaz, and Zircon.
(v) Systematic mineralogy of Sorosilicates- Epidote, Staurolite and Sphene.

Unit 4. (i) Systematic mineralogy of Cyclosilicates – Cordierite, Tourmaline and Beryl.
(ii) Systematic mineralogy of Inosilicates – Pyroxene and Amphibole groups.
(iii) Systematic mineralogy of Phyllosilicates – Mica, Chlorite, Serpentine, Clay minerals, Kaolinite and Talc.
(iv) Systematic mineralogy of Tectosilicates- Silica, Felspar, Feldspathoids and Zeolite groups.
(v) Gems and Semiprecious stones.

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DEPARTMENT OF GEOLOGY
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M.Sc. Geology 2025-26

FIRST SEMESTER
Paper- III Advance Mineralogy and Crystallography

Books Recommended

Deer, W.A., Howie, R.A., and Zussman, J., 1996: The Rock Forming Minerals. Longman.
Klein and Hurlbut, Jr., C.S., 1993: Manual of Mineralogy. John Wiley.
Phillips, W.R. and Griffen, D.T., 1986: Optical Mineralogy. CBS Edition.
Perkins, D. 2002: Mineralogy. Prentice Hall.
Nesse, W.D., 2000: Introduction to Mineralogy. Oxford University Press.

Question Paper Format and Distribution of Marks for PG Semester Examination

Question paper format for the Post-Graduate Examination has been revised from the Session 2018-19. The revised format will be applicable for all the question papers of Semester I, II, III & IV. The following are the main points of the new format:

1. The question paper will be of **80 marks** (as before)
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows:

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**

Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note:

1. Question no. 1 and Question 2 will be compulsory.
2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.

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3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.

5. Internal Assessment Examination will be as follows :
   i. Internal Test in each paper. (20 marks)
   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)
   iii. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

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Course Outcome Paper IV: Geochemistry, Instrumentation and Analytical Techniques

At the end of the course, the students will be able to

1. Understand about the chemical differentiation of solar system and the earth,
2. Formulate the radioactive decay schemes and their application in radiometric dating, recall laws of Thermodynamics and geochemistry of oceanic crust, continental crust and island arcs.
3. Explain element partitioning in minerals and rocks and its use in P-T Estimation; Understand elemental mobility in Geochemical cycle and Bio geochemical cycle.
4. Describe instrumentation and analytical techniques used in geochemical analysis.

FIRST SEMESTER

Paper- IV: Geochemistry, Instrumentation and Analytical Techniques

Max. Marks 80 **Min. Marks 16**

Unit 1.
(i) Origin and abundance of elements in solar system and in the earth and its constituents.
(ii) Special properties of transition and rare earth elements.
(iii) Geochemical classification of elements.
(iv) Principles of ionic substitution in minerals. Isomorphism, polymorphism and Pseudomorphism.
(v) Radiogenic isotopes, Stable isotopes: nature, abundance and fractionation.

Unit 2.
(i) Radioactive decay schemes of U-Pb, Sm-Nd, Rb-Sr, K-Ar and growth of daughter isotopes.
(ii) Radiometric dating of single minerals and whole rocks.
(iii) Laws of Thermodynamics: Concepts of free energy, fugacity and equilibrium constant.
(iv) Geochemistry of oceanic crust. Composition of continental crust.
(v) Geochemistry of island arcs.

Unit 3.
(i) Element partitioning in minerals. Element partitioning in rocks.
(ii) Concept of simple distribution coefficients.
(iii) Use of Element partitioning in P-T Estimation.
(iv) Elemental mobility in surface environment Mineral stability in Eh-pH diagram.
(v) Geochemical cycle. Bio geochemical cycle.

Unit 4.
(i) X-ray Diffractrometry, X-ray Fluorescence spectrometry.
(ii) Scanning and Transmission, electron microprobe analysis.
(iii) Thermal ionization and gas source mass spectrometry.
(iv) Principles and application of AAS. Principles and application of cathodo-luminiscence, thermoluminiscence.
(v) Sampling and sample preparations. Sample etching, staining and modal count techniques. Techniques of photomicrography.

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Books Recommended

Mason B. and Moore, C.B., 1991: Introduction to Geochemistry. Wiley Eastern.
Krauskopf, K.B., 1967: Introduction to Geochemistry. McGraw Hill.
Henderson, P. 1987: Inorganic Geochemistry. Pergamon Press.
Faure, G.,:1986: Principles of Isotope Geology. John Wiley.

Question Paper Format and Distribution of Marks for PG Semester Examination

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3. From each Unit, the questions will be asked as follows :

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**
Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note:

1. Question no. 1 and Question 2 will be compulsory.
2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.
3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

   Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.
4. Internal Assessment Examination will be as follows :
   i. Internal Test in each paper. (20 marks)
   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

Course Outcome Lab Course - I

At the end of the course, the students will be able to

1. Identify various landforms and distinguish various types of drainage patterns.
2. Do calculations of Morphometric analysis.
3. Demonstrate the skill of preparation of geological cross sections and interpretations of geological maps, Completion of outcrops.
4. Solve structural problems with the help of stereographic projections.
5. Identify structures present in natural rock specimens and models.

FIRST SEMESTER
PRACTICALS

LAB COURSE - I

1. Study of various models of landforms.
2. Morphometric analysis.
3. Study of various types of drainage patterns.
4. Preparation and Interpretations of geological maps and sections and completion of outcrops.
5. Solution of structural problems with the help of stereographic projections.
6. Plotting and interpretation of petro fabric data and resultant diagrams.
7. Study of structures present in natural rock specimens and wooden models.

Course Outcome Lab Course - II

At the end of the course, the students will be able to

1. Identify rock forming minerals in hand specimen and thin section
2. Determine pleochroic scheme in minerals.
3. Estimate Anorthite content in plagioclase.
4. Determine order of interference colour in common minerals.
5. Interpret of results of water analysis with the help of various diagrams.

LAB COURSE - II

1. Megascopic and microscopic study of rock forming minerals.
2. Preparation of thin sections and polished section of minerals.
3. Determination of pleochroic scheme in minerals, Anorthite content in plagioclase.
4. Estimation of birefringence, determination of order of interference colors and sign of elongation in common minerals.
5. Study of interference figure and determination of optic sign.
6. Interpretation of results of water analysis with the help of various diagrams.
7. Study of crystal models of various crystal systems.
8. Numerical based on radioactive age dating.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Program Outcomes of M.Sc. Geology

PO1: Knowledge: Acquire an overview of concepts, fundamentals and advancements of science across a range of fields, with in-depth knowledge in at least one area of study. Develop focused field knowledge and amalgamate knowledge across different disciplines.

PO2: Complementary skills: Students will be able to engage in critical investigation through principal approaches or methods and through effective information search and employ highly developed conceptual, analytical, quantitative and technical skills and are adept with a range of technologies.

PO3: Applied learning: Students will be able to apply disciplinary or interdisciplinary learning across multiple contexts, integrating knowledge and practice. Recognize the need for information; effectively search for, evaluate, manage and apply that information in support of scientific investigation or scholarly debate.

PO4: Communication: Communicate effectively on scientific achievements, basic concepts and recent developments with experts and with society at large. Able to comprehend and write reports, documents, make effective presentation by oral and/or written form.

PO5: Problem solving: Investigate, design and apply appropriate methods to solve problems in science, mathematics, technology and/or engineering.

PO6: Environment and sustainability: Understand the impact of the solutions in ethical, societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.

PO7: Teamwork, collaborative and management skills: Recognize the opportunities and contribute positively in collaborative scientific work. Engage in intellectual exchange of ideas with other disciplines.

Program Specific Outcomes of M.Sc. Geology

The student graduating with the M.Sc. Geology will be able to

1. Acquire fundamental/systematic or coherent understanding of the academic field of Geology, its different learning areas.
2. Demonstrate the ability to use skills in Geology and its related areas of technology for formulating and tackling geosciences-related problems and identifying and applying appropriate geological principles and methodologies to solve a wide range of problems associated with geosciences.
3. Demonstrate competencies related to problem-solving skills that are required to solve different types of geosciences-related problems and investigative skills, including skills of independent investigation of geosciences-related issues and problems.
4. Develop Communication skills and analytical skills ability to work both independently and in Teams involving the ability to read texts and research papers analytically and to present information in a concise manner.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Syllabus and Marking Scheme for Second Semester

Paper No.	Title of the Paper	Marks Allotted in Theory		Marks Allotted in Internal Assessment		Credits
		Max	Min	Max.	Min.	
I	Igneous Petrology	80	16	20	04	05
II	Sedimentology	80	16	20	04	05
III	Metamorphic Petrology	80	16	20	04	05
IV	Palaeobiology and Stratigraphy	80	16	20	04	05
V	Lab Course I	100	36			04
IV	Lab Course II	100	36			04
	Field Work/Report + Viva	100				04
	Total	**620**		**80**		**32**

Field Work- Every student shall have to undergo geological field work for at least two weeks (14 days) in the Second Semester also. At the end of the Second Semester, each student shall have to submit field report covering all aspects of geological field work for evaluation. It is compulsory for each student to appear in a viva and she/he shall give a presentation on the field work done by him/her.

Marks allotted for field Report: 50 Marks allotted for Viva on field work: 50

Theory - 320

Internal Assessment - 80

Practical - 200

Field work/Report + viva - 100

Total Marks - 700

GENERAL INSTRUCTIONS FOR STUDENTS

1. The candidate has to obtain minimum 20% marks in each theory paper and internal assessment separately.
2. The candidate has to secure minimum 36% marks as an aggregate in order to pass that semester examination.
3. The internal assessment shall include class test, home assignment and seminar presentation.

Chairperson /H.O.D Subject Expert Subject Expert Subject Expert

Senior Professor of Science Faculty Departmental members Alumnus Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Course Outcome Paper- I: Igneous Petrology

At the end of the course, the students will be able to:-

1. Explain about the concepts of phase equilibria, Bowen's Reaction Series and petrographic province and describe various forms, structures and textures of igneous rocks.
2. Relate behavior of major and trace elements to the evolution of magma.
3. Classify the igneous rocks and describe their megascopic and microscopic characters and discuss their petrogenesis.
4. Summarize the generation of magma with reference to plate tectonics and explain petrogenesis of various igneous rocks.

SECOND SEMESTER

Course code: - MGL 201, Paper- I Igneous Petrology

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Principles and general concept of petrology, petrography & petrogenesis.
(ii) Various forms, structures and textures of igneous rocks & their significance in petrogenesis.
(iii) Phase equilibria of unicomponent, Binary (mixed & eutectic) silicate systems.
(iv) Phase equilibria of Ternary (Albite-Anorthite-Diopside and Forsterite- Diopside-Silica) Silicate systems.
(v) Bowen's reaction series. Petrographic Province.

Unit 2. (i) Composition of primary magma; mantle mineralogy.
(ii) Factors affecting evolution of magma. Magmatic differentiation processes.
(iii) Partial melting of mantle – different models. Trace element behavior during partial melting.
(iv) Behavior of major and trace elements during fractional crystallization.
(v) Concurrent assimilation and fractional crystallization. Magma mixing.

Unit 3. (i) Criteria for classification of the igneous rocks. Factors of chemical composition & mineral composition. Tabular classification. CIPW and Niggli values. Petrogenetic study of the following rock types and their distribution in India:
(ii) Basalt and Ophiolite.
(iii) Peridotite, Komatiite,
(iv) Granite, Anorthosite.
(v) Kimberlite and Lamproite.

Unit 4. (i) Rock suite and series. Generation of magma with reference to plate tectonics.
(ii) Petrogenetic study of Carbonatite, Lamprophyre, and their distribution in India.
(iii) Mid-oceanic ridge volcanism and oceanic intra-plate volcanism.
(iv) Magmatism associated with subduction related igneous activity- continental and island arc.
(v) Magmatism in Large Igneous Plutons and continental alkaline magmatism.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

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DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Books Recommended

Turner, F.J., 1980: Metamorphic Petrology. McGraw Hill, New York.
Yardley, B.W. 1989: An Introduction to Metamorphic Petrology. Longman. New York.
Philpotts, A., 1992: Igneous and Metamorphic Petrology. Prentice Hall.
Best, M.G., 1986: Igneous and Metamorphic Petrology, CBS Publishers.
Bose, M.K., 1997: Igneous Petrology. World Press.
Winter, J.D., 2001: Igneous and Metamorphic Petrology. Prentice Hall India Ltd.

Question Paper Format and Distribution of Marks for PG Semester Examination

Question paper format for the Post-Graduate Examination has been revised from the Session 2018-19. The revised format will be applicable for all the question papers of Semester I, II, III & IV. The following are the main points of the new format:

1. The question paper will be of **80 marks** (as before).
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows:
   - Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
   - Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
   - Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**
   - Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note:

1. Question no. 1 and Question 2 will be compulsory.
2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.
3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

   Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.
4. Internal Assessment Examination will be as follows:
   - i. Internal Test in each paper. (20 marks)
   - ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   - iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)
   - iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Course Outcome Paper- II: Sedimentology

At the end of the course, the students will be able to

1. Evaluate the role of various sedimentary environments in the formation of sedimentary rocks and evolution of sedimentary basins.
2. Identify various structures and textures of sedimentary rocks and classify the sedimentary rocks on the basis of their megascopic and microscopic characters.
3. Explain various aspects of analysis of sedimentary rocks.
4. Summarize Field and Laboratory techniques in Sedimentology.

SECOND SEMESTER
Paper- II : Sedimentology

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Earth Surface System: Liberation and flux of sediments.
(ii) Sedimentary environments. Continental alluvial, fluvial, lacustrine, desert, aeolian and glacial sedimentary systems.
(iii) Marine and continental evaporates. Shallow water carbonates. Shallow coastal clastics.
(iv) Deep Sea Basins. Volcanoclastics.
(v) Evolution of Sedimentary Basins: Tectonics and Sedimentation.

Unit 2. (i) Textures of sedimentary rocks.
(ii) Classification of sedimentary rocks.
(iii) Sedimentary facies.
(iv) Petrographic description of sedimentary rocks.
(v) Structures of sedimentary rocks.

Unit 3. (i) Palaeocurrent and Basin Analysis.
(ii) Palaeoclimate analysis.
(iii) Palaeoenvironment analysis
(iv) Top and Bottom Criteria.
(v) Application of trace element, rare earth element and isotope geochemistry to sedimentological problems.

Unit 4. (i) Field and Laboratory techniques in Sedimentology, recording of sedimentological structures.
(ii) Grain size analysis of sedimentary rocks: Graphic representation of data and calculation of statistical parameters.
(iii) Preparation of thin section and staining.
(iv) Cathodoluminescence, use of Coulter counter.
(v) Heavy minerals in sedimentary rocks and their significance.

Books Recommended

Alen, J.R.L., 1985: Principles of Physical Sedimentation. George Allen and Unwin.
Allen, P., :1997: Erath Surface Processes. Blackwell.
Nichols, G.,1999: Sedimentology and Stratigraphy. Blackwell.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

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DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Pettijohn, F.J., Potter, P.E. and Siever, R., 1990: Sand and Sandstone. Springer Verlag.
Boggs Sam Jr., 1995: Principles of Sedimentology and Stratigraphy. Prentice Hall.
Sengupta, S., 1997: Introduction to Sedimentology. Oxford –IBH.

Question Paper Format and Distribution of Marks for PG Semester Examination

Question paper format for the Post-Graduate Examination has been revised from the Session 2018-19. The revised format will be applicable for all the question papers of Semester I, II, III & IV. The following are the main points of the new format:

1. The question paper will be of **80 marks** (as before)
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows:

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**
Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**
Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	**2 x 2 = 4 Marks**	**2 x 2 = 4 Marks**	**2 x 2 = 4 Marks**	**2 x 2 = 4 Marks**
Short (1 Question) 200-250 words	**1 x 4 = 4 Marks**	**1 x 4 = 4 Marks**	**1 x 4 = 4 Marks**	**1 x 4 = 4 Marks**
Long answer (1 Question) 400-450 words	**1 x 12 = 12 Marks**	**1 x 12 = 12 Marks**	**1 x 12 = 12 Marks**	**1 x 12 = 12 Marks**

Note: 1. Question no. 1 and Question 2 will be compulsory.

2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.
3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit. Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.
4. Internal Assessment Examination will be as follows:
   i. Internal Test in each paper. (20 marks)
   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)
   iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Course Outcome Paper- III: Metamorphic Petrology

At the end of the course, the students will be able to

1. Describe agents and types of metamorphism, various types, forms, structures and textures of metamorphic rocks and describe their megascopic and microscopic characters.
2. Explain mineralogical phase rule, ACF, AKF, and AFM, diagrams and various facies.
3. Discuss regional and thermal metamorphism of various groups of rocks and elaborate metamorphic reactions and special types of metamorphism.
4. Explain paired metamorphic belts with reference to Plate Tectonics and influence of P-T conditions on metamorphism.

SECOND SEMESTER

Paper- III: Metamorphic Petrology

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Metamorphism: Definition, Agents, Types of metamorphism.
(ii) Structures of metamorphic rocks, metamorphic grades, Zones,
(iii) Textures of metamorphic rocks.
(iv) Classification of metamorphic rocks.
(v) Study of important metamorphic rocks- Granulite, Charnockite, Eclogite, migmatites, Khondalite, Gondite.

Unit 2. (i) Mineralogical phase rule of closed and open systems.
(ii) Graphic representation of metamorphic mineral assemblages, ACF, AKF, and AFM, diagrams
(iii) Metamorphic Facies.
(iv) Facies of low pressures, medium to high pressure and very high pressure with special reference to characteristic metamorphic zones and subfacies.
(v) Facies of very high pressure with special reference to characteristic metamorphic zones and subfacies.

Unit 3. (i) Regional and Thermal metamorphism of mafic, ultramafic rocks, pelitic sediments, and impure calcareous rocks.
(ii) Ocean floor metamorphism.
(iii) Ultra-high Temperature, ultra-high-pressure metamorphism.
(iv) Metasomatism and its types.
(v) Retrograde metamorphism.

Unit 4. (i) Metamorphic differentiation.
(ii) Anatexis and origin of migmatites in the light of experimental studies.
(iii) Pressure – Temperature – Time paths.
(iv) Paired metamorphic Belts, Regional metamorphism and paired metamorphic belts with reference to Plate Tectonics.
(v) Nature of metamorphic reactions and Pressure-Temperature conditions of metamorphism Isograd and isoreactiongrad.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

SECOND SEMESTER

Paper- III: Metamorphic Petrology

Books Recommended

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Yardley, B.W. 1989: An Introduction to Metamorphic Petrology. Longman. New York.
Philpotts, A., 1992: Igneous and Metamorphic Petrology. Prentice Hall.
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Question Paper Format and Distribution of Marks for PG Semester Examination

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3. From each Unit, the questions will be asked as follows :

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**

Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note: 1. Question no. 1 and Question 2 will be compulsory.

2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.

3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.

4. Internal Assessment Examination will be as follows:
   i. Internal Test in each paper. (20 marks)
   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)
   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)
   iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

Course Outcome Paper IV: Palaeobiology and Stratigraphy

At the end of the course, the students will be able to

1. Explain fundamental concepts about origin and history of evolution of life and morphology and evolution of Brachiopoda, Echinodermata and Mollusca. Evaluate the principles of Stratigraphy and details of Geological Time scale.
2. Describe morphology and evolution of plant fossils, Trilobites, Graptoloites, man and horse.
3. Explain various kinds of stratigraphy and stratigraphic correlation. Describe Indian stratigraphic systems of Archean, Dharwar, Cuddapah, Kurnool, Vindhyan and Aravalli Supergroups.
4. Assess the significance of the Geological Time events of The Paleozoic, Gondwana, Triassic, Jurassic and Cretaceous and the Tertiary Group, Siwaliks, Deccan Trap and boundary problems of various ages.

SECOND SEMESTER
Paper- IV: Palaeobiology & Stratigraphy

Max. Marks 80 **Min. Marks 16**

Unit 1. (i) Species concept, biometrics, molecular systematics, phylogeny.
(ii) Mechanisms of evolution – origin of life, origin of metazoan.
(iii) Major events in the history of Precambrian and Phanerozoic life.
(iv) Growth and allometry, theoretical and functional morphology and evolutionary trends in Brachiopoda and Echinoderms.
(v) Growth and allometry, theoretical and functional morphology and evolutionary trends in Mollusks.

Unit 2. (i) Growth and allometry, theoretical and functional morphology and evolutionary trends in Trilobites and Graptolites.
(ii) Brief introduction and significance of vertebrate palaeontology and micropalaeontology.
(iii) Evolutionary history of man.
(iv) Evolutionary history of horse.
(v) Significance of plant fossils.

Unit 3. (i) Controls on the development of stratigraphic records.
(ii) Lithostratigraphy and chronostratigraphy, stratigraphic correlation.
(iii) Biostratigraphy – controlling factors, zonation, time significance, quantitative stratigraphy, Magnetostratigraphy.
(iv) Cyclostratigraphy, event stratigraphy, pedostratigraphy, seismic stratigraphy and sequence stratigraphy.
(v) Indian Precambrian stratigraphic systems of Archean, Dharwar, Cuddapah, Chhattisgarh and Vindhyan Supergroups.

Unit 4. (i) Geological Time events of the Paleozoic and Gondwana in India.
(ii) Geological Time events of Triassic, Jurassic and Cretaceous and the Tertiary Group in India
(iii) Deccan Traps.
(iv) Stratigraphy of Siwaliks in India.
(v) Boundary problems of various ages.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026

SECOND SEMESTER
Paper- IV: Palaeobiology & Stratigraphy

Books Recommended

Clarkson, E.N.K., 1998: Invertebrate Palaeontology and Evolution. IV Ed. Blackwell.

Jain, P.C., and Anantharaman, M.S., 1996: Palaeontology – Evolution and animal distribution. Vishal Publications.

Prothero, D.R., 1998: Bringing fossils to life- An Introduction to Palaeobiology. McGrawHill.

Stearn, C.W. and Carrol, R.L., 1989: Palaeontology- the record of life. John Wiley.

Boggs Sam Jr., 1995: Principles of Sedimentology and Stratigraphy. Prentice Hall.

Kumar, Ravindra,1985 : Fundamentals of Historical Geology and Stratigraphy of India. Wiley Eastern Ltd.

Naqvi, S.M. and Rogers, J.J.W,1987: Precambrian Geology of India. Oxford University Press.

Question Paper Format and Distribution of Marks for PG Semester Examination

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1. The question paper will be of **80 marks** (as before)
2. Questions will be asked Unit-wise in each question paper.
3. From each Unit, the questions will be asked as follows:

Q.1 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.2 Very short answer type question **(Answer in one or two sentences)** **(02 Marks)**

Q.3 Short answer type question **(Answer in 200-250 words)** **(04 Marks)**

Q.4 Long answer type questions **(Answer in 400-450 words)** **(12 Marks)**

Type of Question	Unit-I	Unit-II	Unit-III	Unit-IV
Very Short (2 Questions) (Maximum two sentences)	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks	2 x 2 = 4 Marks
Short (1 Question) 200-250 words	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks	1 x 4 = 4 Marks
Long answer (1 Question) 400-450 words	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks	1 x 12 = 12 Marks

Note: 1. Question no. 1 and Question 2 will be compulsory.

2. Question no. 3 and 4 will consist of 2 optional questions of which one has to be attempted.

3. As mentioned above, two compulsory very short answer type questions (2+2 marks), one short answer type question with internal choice (4 marks) and one long answer type question with internal choice (12 marks) will be asked from each unit.

   Thus there will be questions of 20 marks from each unit and of total 80 marks from all the four units of the syllabus/syllabi.

4. Internal Assessment Examination will be as follows:

   i. Internal Test in each paper. (20 marks)

   ii. Seminar (Power point presentation) in any one of the paper. (20 marks)

   iii. Assignment in each of the remaining papers (excluding the paper of Seminar. (20 marks)

   iv. Average of marks obtained in internal test + seminar in any one paper and marks obtained in internal test + assignment in rest of the papers will be calculated and taken into consideration.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

Senior Professor of Science Faculty | Departmental members | Alumnus | Student

DEPARTMENT OF GEOLOGY
GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG (C.G.)
M.Sc. Geology 2025 – 2026
SECOND SEMESTER
PRACTICALS

Course Outcome Lab Course – I

At the end of the course, the students will be able to

1. Identify various forms, structures and textures of igneous and metamorphic rocks.
2. Draw variation diagrams.
3. Construct ACF, AKF and AFM diagrams.

LAB COURSE – I

1. Megascopic and microscopic study of igneous lithotypes and preparation of thin sections .
2. Calculation of CIPW Norms.
3. Preparation of variation diagrams.
4. Megascopic and microscopic study of metamorphic rocks of different facies.
5. Graphic construction of ACF, AKF and AFM diagrams.

Course Outcome Lab Course – II

At the end of the course, the students will be able to

1. Identify various sedimentary rocks and primary, secondary and biogenic sedimentary structures in hand specimens, field photographs and outcrops.
2. Prepare rose diagram from palaeocurrent data.
3. Calculate statistical parameters related to Grain size analysis.
4. Identify important fossils from Indian stratigraphic horizons.
5. Plot stratigraphic horizons in the outline map of India.

LAB COURSE – II

1. Megascopic and microscopic identification of sedimentary rocks and study of primary, secondary and biogenic sedimentary structures in hand specimens, field photographs and wherever possible on the outcrops.
2. Exercises related to palaeocurrent data from different environments.
3. Grain size analysis and calculation of statistical parameters.
4. Study of Important fossils from Indian stratigraphic horizons.
5. Exercises on stratigraphic classification and correlation.
6. Plotting of stratigraphic horizons in the outline map of India.
7. Study of rocks and their sequential arrangement according to geological age.

Chairperson /H.O.D | Subject Expert | Subject Expert | Subject Expert

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