

FOUR YEAR UNDERGRADUATE PROGRAM (NEP-2020)

Program: Bachelor in Science (2024 -28)

DISCIPLINE – GEOLOGY

Session – 2024 -25

DSC -01 to 08		DSE -01 to 12	
Code	Title	Code	Title
GESC -01T	Fundamentals of Geology	GESE -01T	Earth & Climate
GESC -01P	Lab. Course -01 (Fundamentals of Geology)	GESE -01P	Lab. Course -01 (Natural resources and management)
GESC -02T	Essentials of Geology	GESE -02T	Environmental Geology
GESC -02P	Lab. Course -02 (Essentials of Geology)	GESE -02P	Lab. Course -02 (Microbiology and Phytopathology)
GESC -03T	Igneous & Metamorphic Petrology	B OSE -03T	Geochemistry
GESC -03P	Lab. Course-03 (Igneous And Metamorphic Petrology)	GESE -03P	Lab. Course -03 (Phytopaleontology and Evolutionary Botany)
GESC -04T	Sedimentary Petrology & Crustal Evolution	GESE -04T	Fuel Geology
GESC -04P	Lab. Course – 04 (Sedimentary Petrology & Crustal Evolution)	GESE -04P	Lab. Course-04 (Ethnobotany & Medicinal plants)
GESC -05T	Principles of Stratigraphy & Indian Geology	B OSE -05T	Paleontology And Evolution of Life
GESC -05P	Lab. Course -05 (Principles Of Stratigraphy And Indian Geology)	GESE -05P	Lab. Course -05 (Biosystematics and Biodiversity)
GESC -06T	Structural Geology	GESE -06T	Geological Mapping Techniques
B OSC -06P	Lab. Course -06 (Structural Geology)	GESE -06P	Lab. Course -06 (Plant breeding and Seed technology)
GESC -07T	Economic Geology – 1: Ore Genesis	GESE -07T	Geological Report Writing
GESC -07P	Lab. Course –07 (Economic Geology – 1: Ore Genesis)	GESE -07P	Lab. Course -07 (Instrumentation and biochemical technology)
GESC -08T	Economic Geology – 2: Ore Deposits	GESE -08T	Mineral Exploration
GESC -08P	Lab. Course –08 (Economic Geology – 2: Ore Deposits)	GESE -08P	Lab. Course -08 (Growth and Stress Physiology)
		GESE -09T	Remote Sensing & GIS
		GESE -09P	Lab. Course -09 (Plant biotechnology and crop improvement)
		GESE -10T	Hydrogeology
		GESE -10P	Lab. Course -10 (Applied Botany and IPR)
		GESE -11T	Minerals And Its Uses in Industry
		GESE -11P	Lab. Course -11 (Biochemistry and Enzymology)
		GESE -12T	Applied Geology
		GESE -12P	Lab. Course-12 (Bioinformatics & Gene Technology)
GE		VAC	
GEGE -01T	Fundamentals of Geology	GEVAC-01	Disaster Management
GEGE -01P	Lab. Course -01 (Fundamentals of Geology)	SEC	
GEGE -02T	Essentials of Geology	GESEC-01	Rain Water Harvesting
GEGE -02P	Lab. Course –02 (Essentials of Geology)		


 M. Athi A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: I	Session:2024-2025
1	Course Code	GESC-01T	
2	Course Title	Fundamentals of Geology	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand basics of Geology, Solar system and internal structure of the Earth, origin and age of the Earth • Understand the theories of continental drift and plate tectonics • Understand causes and effects of earthquakes and explain weathering and its products • Describe concepts of geomorphology and landforms developed by various geological agencies • Explain about the physiographic and tectonic divisions of India 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40

PART- B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)

Unit	Topics (Course Contents)	No. of Period
I	General Geology & Geodynamics: Introduction to Geology; Geology and its relation with other branches of science; Earth and solar system; Theories regarding origin and age of the Earth; Shape and structure of the Earth; Introduction to Continental Drift, Sea-floor spreading & Plate Tectonics. Introduction to Geomorphology: Definition of Geomorphology; Erosional & Depositional features of various Geomorphological Agents (River, Wind and Glacial).	15
II	Structural Geology: Its definition; Attitude of Beds (Dip and Strike). Introduction to Fold, Fault and Joints. Economic Geology: Its definition, Introduction to important Indian mineral deposits (metallic and non-metallic). Introduction to important ore forming processes (magmatic, hydrothermal, supergene sulphide enrichment, mechanical concentration)	15
III	Stratigraphy: Its definition, Principles of Stratigraphy, Types of Correlation, Geological Time Scale. Palaeontology: Its definition, Fossil, Mode of Preservation, Uses of Fossil, Index Fossil	15
IV	Applied Geology: Definition and Scope of Hydrogeology. Definition and Scope of Engineering Geology. Definition and Scope of Mining Geology. Definition and Scope of Environmental Geology, Definition and Scope of Mineral Exploration	15



 M. Arif A. Sha SS Bhadauriya S D. Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

1. भौतिक-भूविज्ञान-डॉ. मुकुल घोष
2. भौतिक-भूविज्ञान-डॉ. जे.पी. तिठारि एं.बी. के. संह
3. भूआकृतिविज्ञान-डॉ. विन्द्र संह
4. भूविज्ञान एक पररचय डॉ. विद्या ागरदुबे
5. भूगतिकी एं भूआकृतिविज्ञान-डॉ. दीपकराजतिठारि

Reference Books

6. Holmes, A. Doris L Holmes Edit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
7. Mahapatra, G.B., Text book of Physical Geology, CBS, India, 2018
8. Mathur, S.M., Physical Geology of India, NBT India, 1991 9. Miller, William J., Physical Geology: An Introduction. D Van Nostrand Co., 5th Ed., 1949
9. Mukerjee, P.K., Text Book of Geology. World Press Private Ltd, 2013.
10. Thornbury, W.D., Principles of Geomorphology. New Age International, 2nd Edition, 196 12. Principles of Geomorphology: A.F. Ahmad

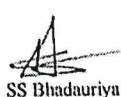
E-resources

1. <https://opentextbc.ca/physicalgeology2ed/front-matter/download-a-pdf/>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://egpg.inflibnet.ac.in>

PART -D:Assessment andEvaluation -Theory**Suggested Continuous Evaluation Methods:**

Maximum Marks:	100 Marks
Continuous Internal Assessment(CIA):	30 Marks
End Semester Exam (ESE):	70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	


M. Arif
A. Sha
SS Bhadauriya
S D Deshmukh
S Kerketta
S Vansutre
N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: I	Session:2024-2025
1	Course Code	GESC-01P	
2	Course Title	Lab. Course -01 (Fundamentals of Geology)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Identify and describe various landforms in geomorphologic models. • Interpret topographical maps 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	<ol style="list-style-type: none"> 1. Physical properties of minerals. 2. Introduction to Clinometer Compass and its use. 3. Study of Geomorphological Models. 		30


M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

1. भौतिक-भूविज्ञान-डॉ. सुकुल घोष
2. भौतिक-भूविज्ञान-डॉ. जे.पी. तिठारि एं.के. संह
3. भूआकृतिकविज्ञान-डॉ. विन्ड संह
4. भूविज्ञान एक परचय डॉ. विद्या ागरदुवे
5. भूतिका एं भूआकृतिकविज्ञान-डॉ. दीपकराजतिठारि

Reference Books

6. Holmes, A. Doris L Holmes Edit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
7. Mahapatra, G.B., Text book of Physical Geology, CBS, India, 2018
8. Mathur, S.M., Physical Geology of India, NBT India, 1991
9. Miller, William J., Physical Geology: An Introduction. D Van Nostrand Co., 5th Ed., 1949
9. Mukerjee, P.K., Text Book of Geology. World Press Private Ltd, 2013.
10. Thornbury, W.D., Principles of Geomorphology. New Age International, 2nd Edition, 196
12. Principles of Geomorphology: A.F. Ahmad

E-resources

1. <https://opentextbc.ca/physicalgeology2ed/front-matte/rdownload-a-pdf/>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkcp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://egpg.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

N. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

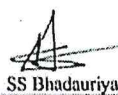
DEPARTMENT OF GEOLOGY

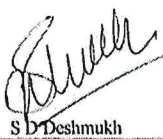
COURSE CURRICULUM

PART-A: Introduction		
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: II
		Session:2024-2025
1	Course Code	GESC-02T
2	Course Title	Essentials of Geology
3	Course Type	Discipline Specific Course
4	Pre-requisite (if any)	As per program
5	Course Learning Outcomes (CLO)	<p>After successfully completing this course, the students will be able to:</p> <ul style="list-style-type: none"> • Explain about the basics of crystallography, various crystal forms, crystallographic axes and symmetry elements. • Describe various forms of normal classes of various crystal systems. Classify the minerals in various silicate groups and explain their varieties. • Describe the physical properties of various minerals. • Describe the optical characteristics of various minerals.
6	Credit Value	3 Credits (Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100 Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE		
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)		
Unit	Topics (Course Contents)	No. of Period
I	Mineralogy: Definition of Mineral, Mineral Classification (Ore forming, rock forming, metallic & Non-metallic etc.). Physical, chemical and optical properties of minerals.	15
II	Crystallography: Definition of Crystal, Crystal Lattice, Classification of Crystal System. Silicate Structure and its types along with mineral examples.	15
III	Petrology: Rock Cycle. Types and Mode of formation of different Rocks (Igneous, Metamorphic and Sedimentary) and their properties. Texture and Structure of Igneous, Metamorphic and Sedimentary rocks.	15
IV	Tabular Classification Igneous Rocks. Classification of Sedimentary Rocks: Clastic, non-Clastic and Biogenic. Types and Agents of Metamorphism.	15


M. Arif

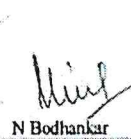

A. Shrivastava


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books**

1. खतनजिथाक्रिस्टलविज्ञान-डॉ. बी. ी. जैश
2. खतनजविज्ञान के सद्ांि डॉ. ए.पी. अग्रवाल
3. प्रकाशीय खतनजविज्ञान के मूलित्ि-विंसेल
4. खतनजिथाक्रिस्टलविज्ञान-डॉ. दीपकरजतििारी

Reference Books

5. Gribble, C.D. Rutley's Elements of Mineralogy. CBS, 2005.
6. Ford W.E.; Dana's Text Book of Mineralogy. CBS, 2006.
7. Perkins, D.; Mineralogy, Prentice Hall India, 3rd ed. 2012.
8. Rathore, B.S.; Basics of Crystallography, Mineralogy and Geochemistry. Notion Press India, 2020
9. Sharma, R.S. and Sharma, Anurag; Crystallography and Mineralogy - Concepts and Methods. Geol. Soc. Ind., Bengaluru, 2013.

e-resources:

1. <https://www.mindat.org>
2. <https://www.mooc-list.com/tags/minerals>
3. <https://epgp.inflibnet.ac.in/Home>
4. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
5. <https://egyankosh.ac.in/>
6. <https://sites.google.com/ignou.ac.in/bscgeology>
7. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
8. National digital library <https://ndl.iitkgp.ac.in>
9. e-PG pathshala (MHRD) portal, <https://epgp.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Signature of Convener & Members (CBoS) :

M. Arif A. Jha SS Bhadauriya S D. Deshmukh S. Kerketta S. Vansutre N. Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: II	Session:2024-2025
1	Course Code	GESC-02P	
2	Course Title	Lab. Course –02 (Essentials of Geology)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand the megascopic properties of Quartz and Feldspar group of minerals • Understand the megascopic properties of pyroxene group of minerals • Understand megascopic properties of Amphibole group of minerals • Describe the megascopic properties of olivine and Mica group of Minerals. • Describe microscopic identification of minerals. • Identify the various crystal Systems and Symmetry through crystal models • Assess the miller Indices of the crystal models • Identify Twining in crystals. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Microscopic study of minerals and rocks. 2) Plotting of important mineral deposits on the outline map of India.		30


 M. A. Ghilani A. Ghilani SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others**

1. खतनजिथाक्रिस्टलविज्ञान-डॉ.बी. ी. जेश
2. खतनजविज्ञान के सद्ांि डॉ. ए.पी. अग्रवाल
3. प्रकाशीय खतनजविज्ञान के मूलित्-विबेल
4. खतनजिथाक्रिस्टलविज्ञान-डॉ. दीपकरजतििारी
5. Gribble, C.D. Rutley's Elements of Mineralogy. CBS, 2005.
6. Ford W.E.; Dana's Text Book of Mineralogy. CBS, 2006.
7. Perkins, D.; Mineralogy, Prentice Hall India, 3rd ed. 2012.
8. Rathore, B.S.; Basics of Crystallography, Mineralogy and Geochemistry. Notion Press India, 2020
9. Sharma, R.S. and Sharma, Anurag; Crystallography and Mineralogy- Concepts and Methods. Geol. Soc. Ind., Bengaluru, 2013.

e-resources:

1. <https://www.mindat.org>
2. <https://www.mooc-list.com/tags/minerals>
3. <https://eggp.inflibnet.ac.in/Home>
4. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
5. <https://egyankosh.ac.in/>
6. <https://sites.google.com/ignou.ac.in/bscgeology>
7. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
8. National digital library <https://ndl.iitkgp.ac.in>
9. e-PG pathshala (MHRD) portal, <https://eggp.inflibnet.ac.in>

PART -D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA): 15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) - 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

N. Anil A. Jha S S Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Diploma/Degree/Honors)		Semester: III	Session:2024-2025
1	Course Code	GESC-03T	
2	Course Title	IGNEOUS AND METAMORPHIC PETROLOGY	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	<p>On completion of Course, the students should be able to</p> <ul style="list-style-type: none"> • Discuss about the formation of igneous rocks, their texture and structures • Explain about forms and classification of igneous rocks • Explain about the formation of metamorphic rocks, their texture and structure • Identify and classify various types of metamorphic rocks. • Explain the concept of metamorphic facies, ACF, AKF and AFM diagrams. 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Igneous petrology: Magma- Definition, Origin, Composition Bowen's Reaction series Magmatic Differentiation & Assimilation Bicomponent Magma- i) Albite - Anorthite System ii) Diopside- Anorthite System 5) Tricomponent- Diopside- Anorthite -Albite system		15
II	Igneous Petrology: Texture, Structure, Forms of Igneous rock Classification of Igneous rock Petrography of Acidic Igneous rock Petrography of Intermediate Igneous rock Petrography of Basic and Ultra basic Igneous Rock		15
III	Metamorphic Petrology: Metamorphosism - Definition & Agents Metamorphosism - Facies and Grades Texture and structure of metamorphic rocks Classification of metamorphic rocks Paragenetic Diagram, ACF and AKF		15
IV	Metamorphic Petrology: Thermal Metamorphism of Argillaceous rock Thermal Metamorphism of Impure Lime stone Metamorphism of Basic Igneous rock Paired Metamorphism Petrography of Slate, Phyllite, Schist, Gneiss, Marble, Quartzite, Amphibolite, Khondalite, Charcoknite		15









Part - C: Learning Resource

Text Books, Reference Books, Others

- (1) शैसलकी क स द्वांन्दि. अंबवकाप्रदअग्रिल
- (2) शैसलकी क स द्वांन्दि - ए.जी. झ ंगल
- (3) Principles of petrology G.W. Tyrell
- (4) Petrology-H.William, F.J. Turner & E.M. Gilbert
- (5) Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee
- (7) Metamorphism & Metamorphic rocks of India - S.Ray
- 8) Principles of igneous and metamorphic petrology john D. winter

E-resources

1. <https://eggp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
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PART - D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
	End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks

Name and Signature of Convener & Members of CBoS:



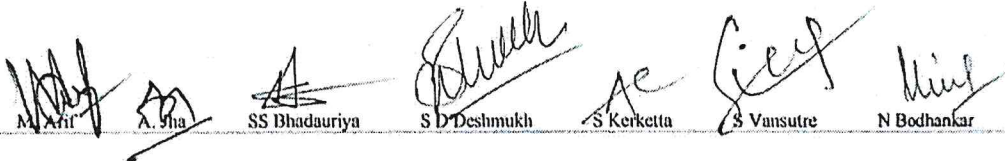






**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Diploma/Degree/Honors)		Semester: III	Session:2024-2025
1	Course Code	GESC-03P	
2	Course Title	Lab. Course-03 (Igneous And Metamorphic Petrology)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to – <ul style="list-style-type: none"> • Identify the igneous, and metamorphic rocks in hand specimens and thin sections. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	<ul style="list-style-type: none"> • Diagrammatic representation of various forms of igneous & Metamorphic rocks • Diagrammatic representation of various structures of igneous & 		30
	Metamorphic rocks <ul style="list-style-type: none"> • Megascopic studies of various metamorphic & igneous rocks. • Microscopic studies of various metamorphic & igneous rocks. • Diagrammatic representation of petrographic provinces of India in outline map of India. • Norms calculation 		



 M. A. H. A. S. H. S. S. Bhadauriya S. D. Deshmukh S. Kerketta S. Vansutre N. Bodhankar

Part - C: Learning Resource	
Text Books, Reference Books, Others	
1.	शैसलकी क स द्ांन्दिों. अंबकाप्रादअग्रिल
2.	शैसलकी क स द्ांन्दि - ए.जी. झ ंगल
3.	Principles of petrology G.W. Tyrell
4.	Petrology-H.William, F.J. Turner & E.M. Gilbert
5.	Petrology of igneous & metamorphic rocks of India- S.C. Chattarjee
6.	Metamorphism & Metamorphic rocks of India - S.Ray
7.	Principles of igneous and metamorphic petrology john D. winter
E-resources	
8.	https://epgp.inflibnet.ac.in/Home
9.	https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up
10.	https://egyankosh.ac.in/
11.	https://sites.google.com/ignou.ac.in/bscgeology
12.	SWAYAM- https://swayam.gov.in/explorer?searchtext
13.	National digital library https://ndl.iitkgp.ac.in
14.	e-PG pathshala (MHRD) portal, https://epgp.inflibnet.ac.in

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

 M. Anil	 A. Sha	 SS Bhadauriya	 S D Deshmukh	 S Kerketta	 S Vansutre	 N Bodhankar
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**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Diploma/Degree/Honors)		Semester: IV	Session:2024-2025
1	Course Code	GESC-04T	
2	Course Title	SEDIMENTARY PETROLOGY & CRUSTAL EVOLUTION	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to - <ul style="list-style-type: none"> • Discuss about the formation of sedimentary rocks, their texture and structures • Explain classification of sedimentary rocks, • Identify, describe and classify sedimentary rocks using hand specimens • The formation of sedimentary rocks, their textures and structures 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Sedimentary Petrology: (1) Origin, Transportation, and Deposition of Sediments (2) Sedimentary Depositional Environment - Aeolian (3) Sedimentary Depositional Environment- Fluvial (4) Sedimentary Depositional Environment- Coastal (5) Sedimentary Depositional Environment- Abyssal		15
II	Sedimentary Petrology: 1. Sedimentary Facies 2. Lithification and Diagenesis 3. Texture and structures of sedimentary rocks 4. Classification of Sedimentary rocks- Clastic,Non- Clastic,Biogenic 5. Petrogenetic description of Sedimentary rocks-Shale, Sandstone, Limestone, Dolomite,Breccia, Conglomerate,Siltstone		15
III	Crustal Evolution: 1. Crust,Mantle, core 2. Oceanic ridges, Mantle plume, Continental rift 3. Craton,Arc system 4. Orogeny,plate Tectonics 5. Hotspots		15
IV	Crustal Evolution: 1. Super Continent- Formation, Cycle , Break up, Mantle plume events 2. Continental Growths 3. Continental Growth rates 4. Mantle Plume events throughout Earth History 5. Metallogeny and its relation to its Evolution in crustal Growth		15


 M. Anil A. Jha SS Bhadauriya S D. Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others**

- (1) शैसलकी क स द्ांन्दि. अंबकाप्र ादअग्रिल
- (2) शैसलकी क स द्ांन्दि - ए.जी. इ ंगल
- (3) Principles of petrology G.W. Tyrell
- (4) Petrology-H. William, F.J. Turner & E.M. Gilbert
- (5) A text book of sedimentary petrology -Verma& Prasad
- (6) Sedimentary rocks -F.J. Pettijohn
- (7) Introduction of sedimentology -S. Sengupta
- (8) Sedimentary environment -H.G. Readings
- (9) petrology of sedimentary rocks: Sam bog
- (10)Earth as an evolving planet system: Kent C. Condie

E-resources

1. <https://eggp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://eggp.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

N. Anil A. Sha SS Bhadauriya S D Deshmukhi S Kerketta S Vansutre N Bodhankar


**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Diploma/Degree/Honors)		Semester: IV	Session:2024-2025
1	Course Code	GESC-04P	
2	Course Title	Lab. Course – 04 (Sedimentary Petrology & Crustal Evolution)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to – <ul style="list-style-type: none"> Identify the Sedimentary rocks in hand specimens and thin sections. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	(1) Megascopic studies of various sedimentary rocks. (2) Microscopic studies of various sedimentary rocks. (3) Diagrammatic representation of various structures of sedimentary (4) Diagrammatic representation of sedimentary provinces of India in outline map of India. (5) Fence diagram		30


M. Anil


A. Jha


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others**

1. शैसलकी क स द्ान्दि-डॉ. अंबकाप्रदाअग्रिल
2. शैसलकी क स द्ान्दि- ए.जी. झ ंगल
3. Principles of petrology G.W. Tyrell
4. Petrology-H. William, F.J. Turner & E.M. Gilbert
5. A text book of sedimentary petrology -Verma& Prasad
6. Sedimentary rocks -F.J. Pettijohn
7. Introduction of sedimentology -S. Sengupta
8. Sedimentary environment -H.G. Readings
9. petrology of sedimentary rocks: Sam bog
10. Earth as an evolving planet system: Kent C. Condie

E-resources

1. <https://epgp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://epgp.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:
M. A. H.
A. Sha
SS Bhadauriya
S D Deshmukh
S Kerketta
S Vansutre
N Bodhankar

**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Degree/Honors)		Semester: V	Session:2024-2025
1	Course Code	GESC-05T	
2	Course Title	PRINCIPLES OF STRATIGRAPHY AND INDIAN GEOLOGY	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to - <ul style="list-style-type: none"> • Understand the principles of Stratigraphy and details of Geological Time scale • Understand Indian stratigraphic systems of Archean, Dharwar, Cuddapah, and Vindhyan Supergroups • Describe the Geological Time events of The Paleozoic, Gondwana, Triassic, Jurassic and Cretaceous and the Tertiary rocks 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Stratigraphy: 1. Principles of Stratigraphy, Geological Time Scale: Various divisions of Geological Time Scale, their nomenclature and type area, 2. Basic concepts of Lithostratigraphic, Chronostratigraphic & Biostratigraphic Units, 3. Tectonic & Physical Subdivisions of Indian subcontinent, 4. Distribution, classification and Economic importance or Archaeozoic rocks of India (Dharwar), 5. Stratigraphy & Economic Importance of Archaeozoic rocks of Bastar (Chhattisgarh).		15
II	Stratigraphy: 1. Distribution, stratigraphy and Economic importance of Cuddapah supergroup of rocks, 2. Distribution, stratigraphy and Economic importance of Vindhyan & Chhattisgarh supergroup of rocks, 3. Distribution, stratigraphy and Economic importance of Chhattisgarh super group and Indravati group of rocks, 4. Paleozoic formation of extra peninsular India.		15
III	1. Stratigraphy, Paleoclimate, Geographical, Geological distribution & economic importance of Gondwana Supergroup, 2. Stratigraphy, distribution and age of Deccan-traps 3. Stratigraphy, Distribution and fossil contents of inter trappean and infra trappean (Bagh & Lameta) Beds, 4. Stratigraphy, Distribution, Fossil content of Cretaceous rocks of Trichonopoly, Stratigraphy, 5. distribution, Fossil content & Economic importance of Jurassic rocks of Kutchh-Region		15

IV	1. Distribution, Stratigraphy, economic importance of Tertiary rocks of Assam-Region, 2. Distribution, Stratigraphy and Palaeontological importance of Siwalik group of rocks. 3. Boundary problem of Permo - Triassic and Cretaceous – Tertiary 4. Indo-Gangetic alluvium	15
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M. Arif


A. Jha


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


N Bodhanekar

Part - C: Learning Resource
Text Books, Reference Books, Others
<p>Text Books Recommended-</p> <ul style="list-style-type: none"> -Danbar, C.O. and Rodgers, J. (1957): Principles of Stratigraphy, John Wiley and Sons. -Doyle, P. and Bennett. M.R. (1996): Unlocking the Stratigraphic Record, John Wiley and Sons. - Krishnan,M.S. (1982): Geology of India and Burma, C.B.S. Publ. and Distributors, Delhi. - Naqvi, S.M. and Rogers, J.J.W. (1987): Precambrian Geology of India, Oxford university press -Wadia,D.(1973).Geology of India. Mc Graw Hill Book co. -Krishnan, M.S.(1982). Geology of India and Burma,6th Edition. CBS Publ. -Ravindra Kumar (1985). Fundamentals of Historical Geology & Stratigraphy of India. Wiley Eastern. - Valdiya, K.S.(2010).The making of India, McMillan India Pvt ltd.

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	<p style="text-align: center;">Laboratory / Field Skill Performance: On spot Assessment</p> <p>A. Performed the Task based on lab. work - 20 Marks</p> <p>B. Spotting based on tools & technology (written) – 10 Marks</p> <p>C. Viva-voce (based on principle/technology)- 05 Marks</p>	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

 M. Anil	 A. Sha	 SS Bhadauriya	 S D Deshmukh	 S Kerketta	 S Vansutre	 N Bodhankar
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**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Degree/Honors)		Semester: V	Session:2024-2025
1	Course Code	GESC-05P	
2	Course Title	Lab. Course -05 (Principles Of Stratigraphy And Indian Geology)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to – <ul style="list-style-type: none"> • Identify rocks from Indian Stratigraphic units. • Plotting of stratigraphic units/ Groups on the map of India. • Identification, study and illustration of fossils from Indian Geology. • Exercise related to correlation of various Indian stratigraphical formations. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Representation of Litho units & Stratigraphic Units in outline map of India. 2) Sketching of physiographic division of India. 3) Heavy minerals studies in stratigraphy		30


M. K. Patil


A. Sha


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C: Learning Resource	
Text Books, Reference Books, Others	
Text Books Recommended-	
-Danbar, C.O. and Rodgers, J. (1957): Principles of Stratigraphy, John Viley and Sons. -Doyle, P. and Bennett. M.R. (1996): Unlocking the Stratigraphic Record, John Viley and Sons. - Krishnan,M.S. (1982): Geology of India and Burma, C.B.S. Publ. and Distributors, Delhi. - Naqvi, S.M. and Rogers, J.J.W. (1987): Precambrian Geology of India, Oxford university press -Wadia,D.(1973).Geology of India. Mc Graw Hill Book co. -Krishnan, M.S.(1982). Geology of India and Burma,6th Edition. CBS Publ. -Ravindra Kumar (1985). Fundamentals of Historical Geology & - Stratigraphy of India. Wiley Eastern. - Valdiya, K.S.(2010).The making of India, McMillan India Pvt ltd.	

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
(CIA): (By Course Teacher)		
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:









**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Degree/Honors)		Semester: VI	Session:2024-2025
1	Course Code	GESC-06T	
2	Course Title	STRUCTURAL GEOLOGY	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	<p>At the end of this course, the students will be able to –</p> <ul style="list-style-type: none"> • Demonstrate the use of Clinometer compass and Brunton compass in measurement of attitude of rock bed. • Explain about parts of fold and classify various folds. • Recognize and classify the faults in the field and on geological map. • Identify and classify Unconformities. • Discuss about various types of Joints. • Explain various types of foliations and lineation. • Identify the top and bottom of rock beds in a series of rocks. 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Attitude of rocks and unconformity: Structural Geology: Definition and scope. Identification of bedding, Dip and strike: definition & measurement. Clinometer and Brunton compass: Unconformity: Definition & types, Outlier and inlier. Overlap & offlap. Recognition of unconformity. Concept of rock deformation,		15
II	Fold: Definition and morphology, Geometric and genetic classification of folds, Recognition of folds in the field and on geological maps, Effect of folds on outcrops, Elementary idea of mechanics of folding.		15
III	Fault: Definition and morphology, Geometric and genetic classification of faults, Recognition of faults in the field and on geological maps, Effect of faults on outcrops, Elementary idea of mechanics of faulting.		15
IV	Joint, Foliation, Lineation and Rock deformation: Joint: Definition, geometric & genetic classification of joints. Foliation: terminology, kinds, origin and relation to major structures, Lineation: terminology, Kinds, origin and relation to major structures, Plutons; tectonics & emplacement, Recognition of top and bottom of beds. Tectonic framework of India		15

M. A. H.

A. S. Jha

S. S. Bhadauriya

S. D. Deshmukh

S. Kerketta

S. Vansutre

N. Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

- 1) ंरचनात्मकभूविज्ञान-डॉ. डी. के. श्रीासिि
- (2) भूिज्ञानतन्त्र ंरचनाएँ डॉ. भरि स ंह राठौर
- (3) प्रायोगिकभूविज्ञान (भाग-2) आर.पी. मंजरेकर
- (4) Structural Geology. M.P. Billings.
- (5) Theory of Structural Geology; Gokhale, N.W. CBS
- (6) Exercises on Geological maps and dip-Strike: Gokhale, N.W. CBS.
- (7) Outlines of structural Geology. E.S. Hills.
- (8) Structural Geology- Hobbs. Means and Williams.
- (9) Geological maps- Chiplonkar and Pawar.

E-resources:

1. <https://eggp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://eggp.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment G. Performed the Task based on lab. work - 20 Marks H. Spotting based on tools & technology (written) – 10 Marks I. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Degree/Honors)		Semester: VI	Session:2024-2025
1	Course Code	GESC-06P	
2	Course Title	Lab. Course -06 (Structural Geology)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	<p>On completion of Course, the students should be able to -</p> <ul style="list-style-type: none"> • Use of Clinometer compass and Brunton compass. • Recognize the folds, faults, unconformities and joints in specimens and models. • Completion of outcrops and preparation of Geological cross section and interpretation of geological history. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Study of Natural Structures in specimens. 2) Study of structures models. 3) Completion of outcrops. 4) Preparation of geological section from simple to complex geological maps and its interpretation.		30
	5) Introductory idea of stereographic projection in structural geology. 6) Field work of three days is compulsory for the students.		


 M. Anil A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

- 1) रचनात्मकभूविज्ञान-डॉ. डी. के. श्रीवास्तव
- (10) भू-ज्ञाननक रचनाएँ डॉ. भरि संह राठौर
- (11) प्रायोगिकभूविज्ञान (भाग-2) आर.पी. मंजोरकर
- (12) Structural Geology. M.P. Billings.
- (13) Theory of Structural Geology; Gokhale, N.W. CBS
- (14) Exercises on Geological maps and dip-Strike: Gokhale, N.W. CBS.
- (15) Outlines of structural Geology. E.S. Hills.
- (16) Structural Geology- Hobbs. Means and Williams.
- (17) Geological maps- Chiplonkar and Pawar.

E-resources:

1. <https://eggp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://eggp.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

M. Afif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Honors)		Semester: VII	Session:2024-2025
1	Course Code	GESC-07T	
2	Course Title	ECONOMIC GEOLOGY – 1: ORE GENESIS	
3	Course Type	Discipline Specific Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	<p>On completion of this course, the students will be able to demonstrate the acquisition of:</p> <ul style="list-style-type: none"> • Strategies for developing and implementing an ore-geological project • How and where to gather basic geological information and, together with fellow students, how to write a sober report that communicates the required information for investors, clients, and other decision-makers that eventually may sponsor the project 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1. Magma, rocks and minerals deposits 1.2 modern concepts of ore genesis. Global perspective 1.3. Processes of formation of mineral deposits - magmatic concentration, contact metamorphism, hydrothermal processes, sedimentation. 1.4. Oxidation and supergene enrichment. Residual and mechanical concentration. 1.5. Active ore forming systems, methods of mineral deposit studies including ore microscopy.		15
II	2.1. Concept of ore bearing fluids, their origin and migration 2.2. Fluid inclusion in ores- limitation and application 2.3. Structural, physio-chemical and stratigraphical control of ore localization. 2.4. Texture, paragenesis and zoning in ores. 2.5. Wall rock alteration		15
III	3.1. Ortho magmatic ore of mafic - ultramafic association - Diamond in Kimberlite, REE in Carbonatites 3.2. Ti-V ores, Chromite and PGE, Ni ores 3.3. Cyprus type Cu-Zn ore deposits 3.4. Ore of silicic igneous rocks- Kiruna type Fe-P. Pegamoids, Greisen and Skarn deposits 3.5. Porphyry associations - Zn-Pb-Cu, Malanjkhand type Cu-Mo deposits		15
IV	4.1. Ores of Sedimentary affiliations _ Chemical and Clastic sediments. 4.2. Ores of Metamorphic affiliations. Metamorphism of ores and metamorphogenic ores.		15
	4.3. Ores related to weathered surfaces – Bauxite, Ni and Au laterite. 4.4. Stratiform and Stratabound ore deposits. (Fe, Mn, nonferrous). Placers and paleoplacers.		

N. A. H.

A. S. H.

S. S. Bhadauriya

S. D. Deshmukh

S. Kerketta

S. Vansutre

N. Bodhankar

Part - C: Learning Resource		
Text Books, Reference Books, Others		
Text Books Recommended-		
<ol style="list-style-type: none"> Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers Ore Deposits Geology Jhon Ridley Cambridge University Press The Geology of Ore Deposits <u>GUILBERT J.M.</u> 2013 CBS Publisher ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher 		
Online Resources		
https://www.mooc-list.com/course/minerals-and-mining-business-edx		
PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment(CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment J. Performed the Task based on lab. work - 20 Marks K. Spotting based on tools & technology (written) – 10 Marks L. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:







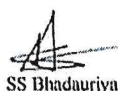


**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Honors)		Semester: VII	Session:2024-2025
1	Course Code	GESC-07P	
2	Course Title	Lab. Course –07 (Economic Geology – 1: Ore Genesis)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Interpretation of Ore mineral in polished sections 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	<ol style="list-style-type: none"> 1. Identification and description of ore minerals in hand specimen; 2. Identification and description of ore minerals in polished sections; 3. Texture & structure of Ore Mineral using ore microscope 		30


M. A. Patil


A. Shrivastava


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


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Part - C: Learning Resource		
Text Books, Reference Books, Others		
Text Books Recommended-		
6. Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers		
7. Ore Deposits Geology Jhon Ridley Cambridge University Press		
8. The Geology of Ore Deposits <u>GUILBERT J.M.</u> 2013 CBS Publisher		
9. ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre		
10. Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher		
Online Resourses		
https://www.mooc-list.com/course/minerals-and-mining-business-edx		
PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment(CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in, Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBOS:









**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Honors)		Semester: VIII	Session:2024-2025
1	Course Code	GESC-08T	
2	Course Title	ECONOMIC GEOLOGY – 2: ORE DEPOSITS	
3	Course Type	Discipline Specific Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	<ul style="list-style-type: none"> • This course will provide basic insights into the genesis of economic mineral deposits that are imperative for modern sustainable societies. • Knowledge: The student will be capable to understand when and how a geological process proceeds to the formation of a common economic mineral deposit where either the minerals or the elements that comprise the minerals may have economic potential. • Skills: The student will be able to read and understand professional publications that are addressing economic mineral deposits. • General competence: The student has a general knowledge about the geological setting of economic mineral deposits hence know where, generally to look for them and has the basic knowledge to participate in ore-geological project groups in developing or mining a mineral deposit, prospecting for ore-deposits or studying for a Master of Science in mineral deposit geology. Finally, the student will be able to identify important ore-forming phases by reflected light microscopy. 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1. Mineral Deposits related to Igneous, Metamorphic and Sedimentary rocks 1.2. Geology, geographical distribution, industrial use of non-metallic minerals used in refractory and fertilizer; 1.3. Geology, geographical distribution, industrial use of non-metallic minerals used in abrasive and paint 1.4. Geology, geographical distribution, industrial use of non-metallic minerals used in cement and ceramic.		15
II	Mineralogy, genesis, distribution in India and the uses of ore deposits of the following: 2.1. Gold, Silver and Platinum 2.2. Copper and Aluminium 2.3. Lead and Zinc 2.4. Tin with respect to Chhattisgarh		15
III	Mineralogy, genesis, distribution and uses of the following metal: 3.1. Iron and Manganese 3.2. Nickel and Cobalt 3.3. Chromium & Magnesium 3.4. Tungsten, molybdenum		15
IV	4.1. Geology, geographical distribution of major coal deposits of India 4.2. Geology, geographical distribution of major petroleum deposits of India 4.3. Geology, geographical distribution of major atomic minerals (U – Th) of India 4.4. Study of distribution of ore deposit in time & space, with special reference to India.		15


N. A. H.


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S D Deshmukh


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Part - C: Learning Resource
Text Books, Reference Books, Others
Text Books Recommended- <ol style="list-style-type: none"> 1. Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers 2. Ore Deposits Geology Jhon Ridley Cambridge University Press 3. The Geology of Ore Deposits GUILBERT J.M. 2013 CBS Publisher 4. ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre 5. Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher
Online Resources https://www.mooc-list.com/course/minerals-and-mining-business-edx

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment M. Performed the Task based on lab. work - 20 Marks N. Spotting based on tools & technology (written) – 10 Marks O. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:









**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Science (Honors)		Semester: VIII	Session:2024-2025
1	Course Code	GESC-08P	
2	Course Title	Lab. Course –08 (Economic Geology – 2: Ore Deposits)	
3	Course Type	Discipline Specific Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand the megascopic properties of ore minerals • Plotting of Ore deposits in map of India 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	<p>1) Study of megascopic properties of ore mineral</p> <p>2) Plotting of major Ore deposits in the Outline map of India</p> <p>Iron, Copper, Aluminum, Lead – Zinc and Gold deposits of India on the outline map of India.</p> <p>Plotting of geographical distribution of major deposits of Coal and Petroleum in India.</p> <p>Plotting of geographical distribution of major deposits used in refractory, fertilizer, abrasive, cement, glass and ceramic, building and precious stones industries on the outline map of India.</p> <p>1) Plotting of major mineral resources (metallic and non-metallic) of Chhattisgarh.</p>		30



 M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhanekar

Part - C: Learning Resource
Text Books, Reference Books, Others
Text Books Recommended- 6. Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers 7. Ore Deposits Geology Jhon Ridley Cambridge University Press 8. The Geology of Ore Deposits <u>GUILBERT J.M.</u> 2013 CBS Publisher 9. ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre 10. Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher
Online Resources https://www.mooc-list.com/course/minerals-and-mining-business-edx

PART - D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks End		
Semester Exam (ESE): 35 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

 N. Arif	 A. Sha	 SS Bhadauriya	 S D Deshmukh	 S Kerketta	 S Vansutre	 N Bodhankar
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

Part A			
Introduction			
Program: Diploma Course		Semester-III	Year: 2025
		Session:2025-2026	
S.No.			
1	Course Code	GESE- 01T	
2	Course Title	Earth and Climate.	
3	Course Type	Discipline Elective Course.	
4	Pre-requisite (if any)	As per institutional guidelines.	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to - <ul style="list-style-type: none"> • Understand the climate and its effect. • Understand the Atmosphere, Biosphere and Hydrosphere. 	
6	Credit Value	Theory : 04	
7	Total Marks	Max. Marks: 100=70 TH + 30 Internal assessment	Minimum Passing Marks : 40

Part B		
Content of the Course		
Total Lectures: 45		
Unit	Topics	No. of Lectures
I	Climate system: Forcing and Responses Components of the climate system Climate forcing, Climate controlling factors, Climate system response, response rates and interactions within the climate system, Feedbacks in climate system.	11
II	Heat budget of Earth, Incoming solar radiation, receipt and storage of heat. Heat transformation Earth's heat budget. Interactions amongst various sources of earth's heat	11
III	Atmosphere-Hydrosphere Layering of atmosphere and atmospheric Circulation Atmosphere and ocean interaction and its effect on climate, Heat transfer in ocean Global oceanic conveyor belt and its control on earth's climate. Surface and deep circulation Sea ice and glacial ice.	11
IV	Response of biosphere to Earth's climate Climate Change: natural vs. anthropogenic effects Humans and climate change, Future perspectives Brief introduction to archives of climate change. Archive based climate change data from the Indian continent Monsoon, Mechanism of monsoon. Monsoonal variation through time Factors associated with monsoonal intensity, Effects of monsoon	12


 A. Afri A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar


Part C	
Learning Resources	
1.	Rudiman, W.F., 2001. Earth's climate: past and future. Edition 2, Freeman Publisher.
2.	Rohli, R.V., and Vega, A.J., 2007. Climatology. Jones and Barlett
3.	Lutgens, F., Tarbuck, E., and Tasa, D., 2009. The Atmosphere: An Introduction to Meteorology. Pearson Publisher
4.	Aguado, E., and Burt, J., 2009. Understanding weather
E-resources	
1.	https://epgp.inflibnet.ac.in/Home
2.	https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up
3.	https://egyankosh.ac.in/
4.	https://sites.google.com/ignou.ac.in/bscgeology
5.	SWAYAM – https://swayam.gov.in/explorer?searchtext
6.	National digital library – https://ndl.iitkgp.ac.in
7.	e-PG pathshala (MHRD) portal, https://epgp.inflibnet.ac.in

PART -D: Assessment and Evaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks:		100 Marks
Continuous Internal Assessment(CIA):		30 Marks
End Semester Exam (ESE):		70 Marks
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	


N. Arif

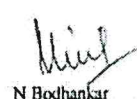

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S D. Deshmukh


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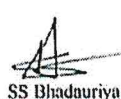

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PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: III	
		Session:2024-2025	
1	Course Code	GESE-01P	
2	Course Title	EARTH & CLIMATE	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of Course, the students should be able to - <ul style="list-style-type: none"> • Understand the climate and its effect. • Understand the Atmosphere,Biosphere and Hydrosphere. 	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1. Study of Rainfall pattern 2. Climatological Study of Indian Subcontinent 3. Assignment related to Climatic/Climate Change with Examples		30


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Part - C
Learning Resource: Text Books, Reference Books, Others
Text Books Recommended- -Climatology by D.s lal -Oceanography by d.s. lal -Physical geography by D R Khullar -Physical geography by savindra singh -Invitation to oceanography by PAUL R. PINET -Essentials of oceanography by Tom S Garrison -Introduction to physical oceanography by Robert H Stewart

PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods: Maximum Marks: 50 Marks Continuous Internal Assessment(CIA):11 Marks End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks - 11	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 11 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:










**FOUR YEAR UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF GEOLOGY
COURSE CURRICULUM**

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: IV	Session:2024-2025
1	Course Code	GESE-02T	
2	Course Title	ENVIRONMENTAL GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	On completion of this course, the students will be able to demonstrate the acquisition of: 1) Understand basics of climatology and oceanography	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1 Concept of ecosystem/ ecology, concept of environmental geology 1.2 Nature and its degradation 1.3 Impact of man and natural system 1.4 Environmental laws, environmental policies if the country		15
II	2.1 Conservation principle, conservation of mineral and fuel resources 2.2 Conservation of soil and water recourses 2.3 Problem pertaining to urbanization, causes and remedies 2.4 Problem pertaining to wasteland and wetlands		15
III	3.1 Human modification of nature in surface and subsurface by engineering construction Dams, Reservoirs, Bridges and Buildings. 3.2 Human settlement and contamination of atmosphere ,soil, surface water and ground water by waste disposal and agro industries 3.3 Global warming , Ozone layer depletion 3.4 Drought, Desertification and salinization		15
IV	Natural hazards measure and mitigation: - 4.1 Landslides, volcanic activity, earthquake 4.2 river flooding, cyclones, tsunami, 4.3 Erosion and coastal erosion 4.4 Marine transgression and regression		15


M. Arif


A. Sha


SS Bhadauriya


SD Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Bryant, E. (1985): Natural Hazards, Cambridge Univ. Press.
- Keller, E.A.(1978): Environmental Geology, Bell and Howell, USA.
- Nagabhushaniah, H.S. (2001): Goundwater in Hydrosphere, CBS Publ.
- Perry, C.T. and Taylor, K.G. (2006): Environmental Sedimentology, Blackwell Publ.
- Singh, S. (2001): Geomorphology, Pustakalaya Bhawan, Allahabad.
- Todd, D.K. (1995): Groundwater Hydrology, John Wiley and Sons.
- Valdiya, K.S.(1987): Environmental Geology – Indian Context, Tata McGraw Hill.

PART -D:Assessment and Evaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment(CIA): 30 Marks

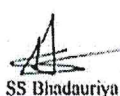
End Semester Exam (ESE): 70 Marks

Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	

Name and Signature of Convener & Members of CBoS:


M. Arif

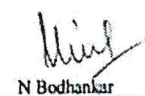

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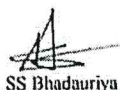

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PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: IV	
		Session:2025-2026	
1	Course Code	GESE-02P	
2	Course Title	ENVIRONMENTAL GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After Successfully completing this course, the students will be able to 1. Understand the environment 2. Describe the geological aspect of interaction between environment and geological processes 3. Explain Mitigation of pollution. 4. Describe Environmental management plan	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	Case study of any Environmental project in nearby area allotted by supervisor/guide		30


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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Bryant, E. (1985): Natural Hazards, Cambridge Univ. Press.
- Keller, E.A.(1978): Environmental Geology, Bell and Howell, USA.
- Nagabhushaniah, H.S. (2001): Goundwater in Hydrosphere, CBS Publ.
- Perry, C.T. and Taylor, K.G. (2006): Environmental Sedimentology, Blackwell Publ.
- Singh, S. (2001): Geomorphology, Pustakalaya Bhawan, Allahabad.
- Todd, D.K. (1995): Groundwater Hydrology, John Wiley and Sons.
- Valdiya, K.S.(1987): Environmental Geology – Indian Context, Tata McGraw Hill.

PART -D:Assessment andEvaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):11 Marks

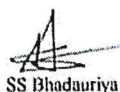
End Semester Exam (ESE): 35 Marks

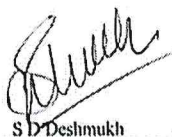
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 11 Marks
	Assignment/Seminar +Attendance - 05 Total Marks -11	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment	Managed by Course teacher as per lab. status
	D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	

Name and Signature of Convener & Members of CBOS:


A. Ghosh


A. Ghosh


SS Bhadauriya


SD Deshmukh


S Kerketta


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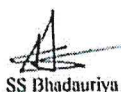

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: V	
		Session:2024-2025	
1	Course Code	GESE-03T	
2	Course Title	GEOCHEMISTRY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand Cosmic Abundance of the Elements and Moon. 2) Composition and Classification of Meteorites 3) Geochemical classifications of elements. 4) Understand Trace elements 5) Understand isotopes 6). Understand geochemistry of crust mantle core	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1. Cosmic Abundance of the Elements and Nucleosynthesis. 2. Geology and Chemistry of Moon. 3. Composition and Classification of Meteorites, Chondrules, Chondrites and Achondrites. 4 Geochemical classification of elements.		15
II	1. Trace, Volatile, Semi volatile, Alkali and Alkaline earth elements. 2. REE and Y, HFSE elements. Transition & Noble elements. 3. Partition coefficient. Compatible and incompatible elements. 4. Basics of radiogenic isotope geochemistry. Scope of stable isotope geochemistry.		15


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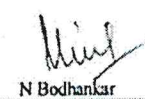

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III	1. Fundamental Thermodynamic Equations. Free energy. Phase equilibrium and Gibb's Phase Rule. Thermodynamics of magmatic Crystallization. 2. Geochemistry of continental and Oceanic Crust and Island Arcs. 3. Growth of continental crust and its mechanism. 4 Composition of Mantle. Phase transition in the Mantle.	15
IV	1. Primitive mantle and mantle differentiation. 2. Geochemical evolution of Mantle Plume. 3. Formation of Core 4 Eutrophication	15

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Drever, J. I., 1988. The Geochemistry of Natural Waters, Prentice Hall, Englewood Cliffs, 437 p.
- Garrels, R. M. and C. L. Christ. 1965. Solutions, Minerals and Equilibria. New York: Harper and Row.
- Burns, R. G. 1970. Mineralogical Applications of Crystal Field Theory. Cambridge: Cambridge Univ. Press.
- Henderson, P. 1986. Inorganic geochemistry. Oxford: Pergamon Press.
- Brownlow, A. H. 1996. Geochemistry. New York: Prentice Hall.
- Krauskopf, K. B. and D. K. Bird. 1995. Introduction to Geochemistry. New York: McGraw-Hill.
- Bowen, R. 1988. Isotopes in the Earth Sciences, Barking (Essex): Elsevier Applied Science Publishers.
- Condie, K. C. 1989. Plate Tectonics and Crustal Evolution. Oxford: Pergamon.
- Faure, G., 1986. Principles of Isotope Geology, 2nd ed., Wiley & Sons, New York, 589p.
- Drever, J. I., 1988. The Geochemistry of Natural Waters, Prentice Hall, Englewood Cliffs, 437 p.
- Garrels, R. M. and C. L. Christ. 1965. Solutions, Minerals and Equilibria. New York: Harper and Row.
- White, W. M. Geochemistry (Online)

PART -D:Assessment andEvaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment(CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

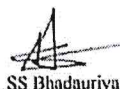
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	



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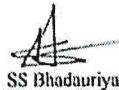
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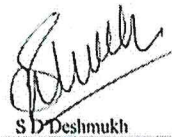
FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY, COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: V	Session:2024-2025
1	Course Code	GESE-03P	
2	Course Title	GEOCHEMISTRY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand Geochemistry of soil, water and minerals	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Geochemical analysis of soil 2) Geochemical analysis of water 3) Geochemical prospecting of minerals and mapping		30


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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Drever, J. I., 1988. The Geochemistry of Natural Waters, Prentice Hall, Englewood Cliffs, 437 p.
- Garrels, R. M. and C. L. Christ. 1965. Solutions, Minerals and Equilibria. New York: Harper and Row.
- Burns, R. G. 1970. Mineralogical Applications of Crystal Field Theory. Cambridge: Cambridge Univ. Press.
- Henderson, P. 1986. Inorganic geochemistry. Oxford: Pergamon Press.
- Brownlow, A. H. 1996. Geochemistry. New York: Prentice Hall.
- Krauskopf, K. B. and D. K. Bird. 1995. Introduction to Geochemistry. New York: McGraw-Hill.
- Bowen, R. 1988. Isotopes in the Earth Sciences, Barking (Essex): Elsevier Applied Science Publishers.
- Condie, K. C. 1989. Plate Tectonics and Crustal Evolution. Oxford: Pergamon.
- Faure, G., 1986. Principles of Isotope Geology, 2nd ed., Wiley & Sons, New York, 589p.
- Drever, J. I., 1988. The Geochemistry of Natural Waters, Prentice Hall, Englewood Cliffs, 437 p.
- Garrels, R. M. and C. L. Christ. 1965. Solutions, Minerals and Equilibria. New York: Harper and Row.
- White, W. M. Geochemistry (Online)

PART -D:Assessment and Evaluation -Practical

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

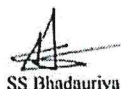
End Semester Exam (ESE): 35 Marks


Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:


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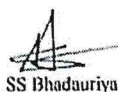

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: VI	
		Session:2024-2025	
1	Course Code	GESE-04T	
2	Course Title	FUEL GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand origin, grades, distribution Coal, petroleum, and atomic mineral deposits	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1. Definition and origin of coal 2. Classification of coal 3. Rank and grading of coal 4. Fundamentals of coal petrology - Introduction to lithotypes, microlithotypes and macerals in coal.		15
II	1. Proximate and ultimate analysis of coal 2. coal as a fuel 3. Coal Bed Methane (CBM) : global and Indian scenario 4. underground coal gasification, Coal liquefaction 5. Distribution of coal: geological and geographical		15
III	1 origin, migration and entrapment of petroleum 2. Properties of source and reservoir rock 3. structural, stratigraphic and combination traps. 4. Methods of petroleum exploration. 5. Petroliferous basins of India.		15
IV	1. Nuclear and non-conventional energy resources. 2. Mode of Occurrence and Association of atomic minerals in nature.		15
	3. Mineralogy of atomic minerals 4. Atomic minerals deposits of India		


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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- * Barker, C. (1996): Thermal Modeling of Petroleum Generation, Elsevier Science.
- * Jahn, F., Cook, M. and Graham, M. (1998): Hydrocarbon Exploration and Production, Elsevier Science.
- * Makhous, M. (2000): The Formation of Hydrocarbon Deposits in North African Basins, Geological and Geochemical Conditions, Springer-Verlag.
- * North, F.K. (1985): Petroleum Geology, Allen Unwin. Selley, R.C. (1998): Elements of petroleum geology, Academic Press.
- * Tissot, B.P. and Welte, D.H. (1984): Petroleum formation and occurrence, Springer-Verlag.
- * Chandra, D., Singh, R.M. and Singh M.P., (2000): Text book of coal (Indian context), Tara Book Agency, Varanasi.
- * Scott, A.C., (1987): Coal and coal bearing strata: Recent Advances, Blackwell Scientific Publications.
- * Isabel Suárez Ruiz John Crelling. (2008). Applied Coal Petrology: The Role of Petrology in Coal Utilization, Academic Press.
- * Taylor, G.H., Teichmuller, M., Davis, A., Diessel, C.F.K., Littke, R. and Robert P., (1998). Organic Petrology, Gebruder Borntraeger, Stuttgart.
- * Singh, M.P. (1998). Coal and organic Petrology. Hindustan Publishing Corporation, New Delhi.
- * Stach, E., Mackowsky, M-Th., Taylor, G.H., Chandra, D., Teichmuller, M. and Teichmuller, R. (1982). Stach Textbook of Coal petrology. Gebruder Borntraeger, Stuttgart.
- * Holson, G.D. and Tiratso, E.N. (1985). Introduction to Petroleum Geology. Gulf Publishing, Houston, Texas.
- * Tissot, B.P. and Welte, D.H. (1984). Petroleum Formation and Occurrence, Springer-Verlag.
- * North, F.K. (1985). Petroleum Geology. Allen Unwin.
- * Selley, R.C. (1998). Elements of Petroleum Geology. Academic Press.
- * Durrance, E.M. (1986). Radioactivity in Geology-principles and application. Ellis Horwood.
- * Dahlkamp, F.J. (1993). Uranium Ore Deposits. Springer Verlag.
- * Boyle, R.W. (1982). Geochemical prospecting for Thorium and Uranium deposits, Elsevier.

E-resources

- * <https://www.my-mooc.com/en/mooc/geoscience-earth-its-resources-delftx-geo101x/>.
- * <https://www.mooc-list.com/course/oil-gas-industry-operations-and-markets-coursera>



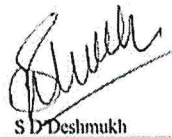
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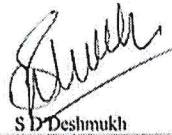
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PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks:		100 Marks
Continuous Internal Assessment(CIA):		30 Marks
End Semester Exam (ESE):		70 Marks
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	


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PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester:VI	
		Session:2024-2025	
1	Course Code	GESE-04P	
2	Course Title	FUEL GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand properties of coal 2) Understand fuel deposits of India	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Study of megascopic properties of coal 2) Plotting of fuel deposits in Outline map of India		30

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- * Barker, C. (1996): Thermal Modeling of Petroleum Generation, Elsevier Science.
- * Jahn, F., Cook, M. and Graham, M. (1998): Hydrocarbon Exploration and Production, Elsevier Science.
- * Makhous, M. (2000): The Formation of Hydrocarbon Deposits in North African Basins, Geological and Geochemical Conditions, Springer-Verlag.
- * North, F.K. (1985): Petroleum Geology, Allen Unwin. Selley, R.C. (1998): Elements of petroleum geology, Academic Press.
- * Tissot, B.P. and Welte, D.H. (1984): Petroleum formation and occurrence, Springer-Verlag.
- * Chandra, D., Singh, R.M. and Singh M.P., (2000): Text book of coal (Indian context), Tara Book Agency, Varanasi.
- * Scott, A.C., (1987): Coal and coal bearing strata: Recent Advances, Blackwell Scientific Publications.
- * Isabel Suárez Ruiz John Crelling. (2008). Applied Coal Petrology: The Role of Petrology in Coal Utilization, Academic Press.
- * Taylor, G.H., Teichmüller, M., Davis, A., Diessel, C.F.K., Littke, R. and Robert P., (1998). Organic Petrology, Gebrüder Borntraeger, Stuttgart.
- * Singh, M.P. (1998). Coal and organic Petrology. Hindustan Publishing Corporation, New Delhi.
- * Stach, E., Mackowsky, M-Th., Taylor, G.H., Chandra, D., Teichmüller, M. and Teichmüller, R. (1982). Stach Textbook of Coal petrology. Gebrüder Borntraeger, Stuttgart.
- * Holson, G.D. and Tiratso, E.N. (1985). Introduction to Petroleum Geology. Gulf Publishing, Houston, Texas.
- * Tissot, B.P. and Welte, D.H. (1984). Petroleum Formation and Occurrence, Springer-Verlag.
- * North, F.K. (1985). Petroleum Geology. Allen Unwin.
- * Selley, R.C. (1998). Elements of Petroleum Geology. Academic press.
- * Durrance, E.M. (1986). Radioactivity in Geology-principles and application. Ellis Horwood.
- * Dahlkamp, F.J. (1993). Uranium Ore Deposits. Springer Verlag.
- * Boyle, R.W. (1982). Geochemical prospecting for Thorium and Uranium deposits, Elsevier.

E-resources

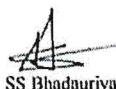
- * <https://www.my-mooc.com/en/mooc/geoscience-earth-its-resources-delftx-geo101x/>.
- * <https://www.mooc-list.com/course/oil-gas-industry-operations-and-markets-coursera>




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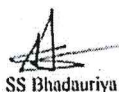
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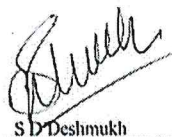
PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods: Maximum Marks: 50 Marks Continuous Internal Assessment(CIA):15 Marks End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:


M. Arif


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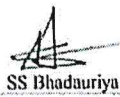

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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: VII	
		Session: 2024-2025	
1	Course Code	GESE-05T	
2	Course Title	PALEONTOLOGY AND EVOLUTION OF LIFE	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand modes of fossilization and uses of fossils. • Identify Gondwana plant fossils. • Describe morphology, geological distribution of Brachiopods, Lamellibranches, • Describe morphology, geological distribution of Trilobites, Gastropods, Graptolites and Echinoids • Understand evolution of vertebrates 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Paleontology: Paleontology: Fossils - definition, essentials and modes of fossilization. Uses of fossils, Derived fossils, Index fossils & their significance, Use of Paleontology in Stratigraphy, Paleoecology & Paleogeography, Brief idea about Micropaleontology and its significance, Introduction to Gondwana plant fossils		15


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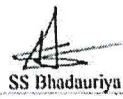
II	I Paleontology: Morphology and Geological distribution of Foraminifera Morphology and Geological distribution of Gastropoda Morphology and Geological distribution of Lamellibranchia fossils, Morphology and Geological distribution of Cephalopoda, Morphology and Geological distribution of Brachiopoda fossils,	15
III	Morphology and Geological distribution of Echinoidea, Morphology and Geological distribution of Trilobite Morphology and Geological distribution of Graptolite fossils. Mass extinction Theory of organic Evolution	15
IV	Elementary idea about the origin of major group of vertebrates Evolution of man Evolution of horse Evolution of elephants General study of Siwalik mammalian fauna	15



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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Invertebrate Palaeontology- H. Woods.
- Introduction to Palaeontology- A.N. Davis.
- An Introduction to Invertebrate Palaeontology- P.G. Jain & M.S. Anantharaman
- Principle of invertebrate paleontology Shrock and twenhofel
- Planetology by Amal das

E-resources

1. <https://epgp.inflibnet.ac.in/Home>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM – <https://swayam.gov.in/explorer?searchtext>
6. National digital library – <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://epgp.inflibnet.ac.in>

PART -D:Assessment andEvaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

Continuous Internal Assessment(CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

**Continuous
InternalAssessment
(CIA):
(By CourseTeacher)**

Internal Test / Quiz-(2): 20 +20
Assignment / Seminar - 10
Total Marks - 30

Better marks out of the two Test /
Quiz + obtained marks in
Assignment shall be considered
against 30 Marks

**End Semester Exam
(ESE):**

Two section – A & B

Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4
=20Marks

Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40
Marks



PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester:VII	
		Session:2024-2025	
1	Course Code	GESE-05P	
2	Course Title	PALEONTOLOGY AND EVOLUTION OF LIFE	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1.) Identify various invertebrate, vertebrates, microfossil and plant fossils on the basis of their morphological characters.	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1 Study of Morphology of Fossils belonging to various phyla. 2) Study of Important plant fossils 3) Study of Important micro fossils 4) Study of Important vertebrate fossils		30


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Part – C**Learning Resource: Text Books, Reference Books, Others****Text Books Recommended-**

- Invertebrate Palaeontology- H.Woods.
- Introduction to Palaeontology- A.N. Davis.
- An Introduction to Invertebrate Palaeontology- P.G. Jain & M.S. Anantharaman
- Principle of invertebrate paleontology Shrock and twenhofel
- Planetology by Amal das

E-resources

- 1 . <https://epgp.inflibnet.ac.in/Home>
8. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
9. <https://egyankosh.ac.in/>
10. <https://sites.google.com/ignou.ac.in/bscgeology>
11. SWAYAM – <https://swayam.gov.in/explorer?searchtext>
12. [National digital library – https://ndl.iitkgp.ac.in](https://ndl.iitkgp.ac.in)
13. e-PG pathshala (MHRD) portal, <https://epgp.inflibnet.ac.in>

PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks		
End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

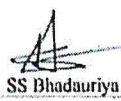
Name and Signature of Convener & Members of CBoS:




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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VII	
		Session:2024-2025	
1	Course Code	GESE-06T	
2	Course Title	GEOLOGICAL MAPPING TECHNIQUES	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Geological mapping techniques, understanding the interaction between topography and geologic structures 2) Basics of field data collection, analyses, interpretation, and geological report writing	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40


PART- B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)

Unit	Topics (Course Contents)	No. of Period
I	1.1. Introduction to Geological Mapping 1.2 Equipments used in Mapping 1.3. Compass- Brunton & Clinometer 1.4. Field Documentation	15
II	2.1. Concept of Base Map 2.2. Topographic Map 2.3. SOI Toposheet- Scale, Numbering 2.4. Reading the Features of Toposheet	15
III	3.1 Basic Field Procedures 3.2. Identification of Rock in Field 3.3. Identification of Mineral in Field 3.4. Identification of Structure in Field	15
IV	4.1. Compass & Tape Traversing 4.2. Specimens and Sample Collection 4.3. Drill core Logging. 4.4. Preparation of Geological Map	15


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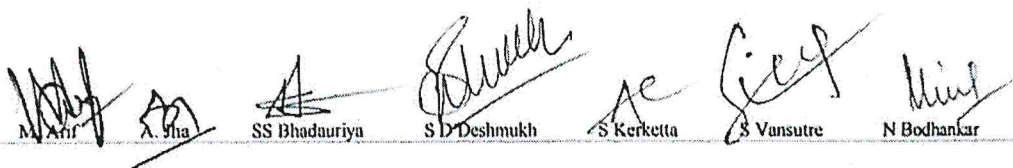

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Part - C		
Learning Resource: Text Books, Reference Books, Others		
Text Books Recommended-		
<ol style="list-style-type: none"> 1. Geology in the Field Robert R. Compton Jhon Ridley Cambridge University Press 2. Field Geology F. H. Lahee CBS Publisher. 6th etd 3. Guide to Field Geology <u>S.M. Mathur</u> PHI 2004 4. A Guide to Field Geology N.W. Gokhale CBS Publisher 		
Online Resources		
https://www.britannica.com/science/field-geology		
PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment(CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	

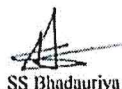



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PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VII	Session:2024-2025
1	Course Code	GESE-06P	
2	Course Title	GEOLOGICAL MAPPING TECHNIQUES	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1.) Geological mapping techniques, understanding the interaction between topography and geologic structures 2.) Basics of field data collection, analyses, interpretation, and geological report writing.	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1. Study of naturally deformed rocks in hand specimens, 2. Preparation and interpretation of geological maps, 3. Applications of stereographic and equal area 4. Geometrical analysis of folds and faults. 5. Geological Field visit- 5 Days		30


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SS Bhadauriya


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S Vansutre


N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-


5. Geology in the Field Robert R. Compton Jhon Ridley Cambridge University Press
6. Field Geology F. H. Lahee CBS Publisher. 6th etd
7. Guide to Field Geology S.M. Mathur PHI 2004
8. A Guide to Field Geology N.W. Gokhale CBS Publisher

Online Resources

<https://www.britannica.com/science/field-geology>


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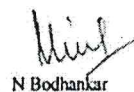

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PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods: Maximum Marks: 50 Marks Continuous Internal Assessment(CIA):15 Marks End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:









FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester:VII	
		Session:2024-2025	
1	Course Code	GESE-07T	
2	Course Title	GEOLOGICAL REPORT WRITING	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> Understand all criteria of report writing 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1. introduction to report writing 2. purpose and nature of report writing 3. Structure and organisation 4. selection of title and title page		15
II	1. language of report writing 2. Abstract - writing pattern, language and content . 3. Table of Content 4. Introduction		15
III	1. Methodology of the report 2. Findings during the experiment/observation 3. Results deduced 4. Discussion on findings		15
IV	1. conclusion reached 2. recommendations suggested 3. listing of references taken 4. Appendices 5. Presentation and layouts		15


M. A. Mir A. Sha SS Bhadauriya S D. Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C		
Learning Resource: Text Books, Reference Books, Others		
Text Books Recommended-		
E-resources		
PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment(CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	


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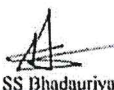

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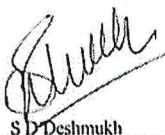
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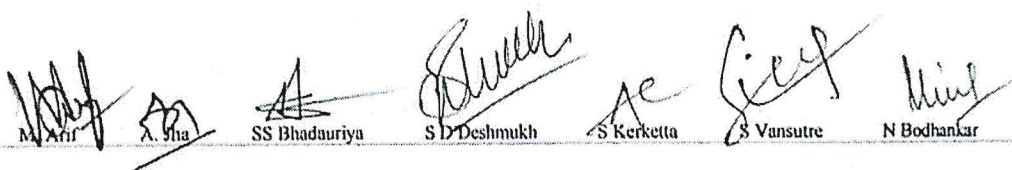
PART-A: Introduction			
Program: Bachelor in Geology (Certificate/Diploma/Degree)		Semester: VII	Session: 2024-2025
1	Course Code	GESE-07P	
2	Course Title	GEOLOGICAL REPORT WRITING	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: Understand literature review, sample report writing	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) literature review 2) sample report writing 3) seminar		30



M. Arif A. Sha SS Bhaduriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C		
Learning Resource: Text Books, Reference Books, Others		
Text Books Recommended-		
E-resources		
PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks		
End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:



M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VII	
		Session:2024-2025	
1	Course Code	GESE-08T	
2	Course Title	MINERAL EXPLORATION	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	<ol style="list-style-type: none"> 1) This course will provide basic insights into the genesis of economic mineral deposits that are imperative for modern sustainable societies. 2) The course is intended to impart basic knowledge about the occurrence and distribution of metallic and non-metallic ores and energy resources in India, and to understand ore-forming processes 3) . The acquired knowledge of ore-formation in deed paved the way of developing methods of ore prospecting, exploration, mining, and beneficiation of economic deposits.. 4) This course will surely help the students for opting carrier in the field of mineral prospection, exploration, and mining industry. 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40

PART- B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)

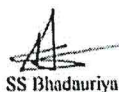
Unit	Topics (Course Contents)	No. of Period
I	1.1. Prospecting & Exploration: Definition and characteristic features. Reconnaissance. Preliminary and detailed investigation, surface and subsurface methods: 1.2. Guides to ore search: global, regional and local guides, detailed study of regional physiographic, stratigraphic, lithological, mineralogical and structural guides. Persistence of ore in depth. 1.3. Drilling: Type of drills, Diamond drilling, Drilling records and logs, Duty of geologists during drilling. 1.4. Sampling: General principles, various methods and procedures, Average assays, weighting of samples, salting. Precautions.	15

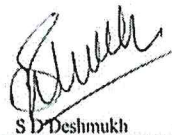

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II	<p>2.1 Calculating grade and tonnage of ore: Average grade, volume, specific gravity, tonnage factor, calculations from data obtained from bore holes, prospecting pits, trenches, ore blocks, geological maps and sections.</p> <p>2.2 Gravity Method of prospecting: Basic principles of gravimeter. Gravity field surveys. Various types of corrections applied to gravity data.</p> <p>2.3 Preparation of gravity anomaly maps. And their interpretation in terms of shape, size and depth</p> <p>2.4 Magnetic method of prospecting: Magnetic properties. Magnetic anomaly. Magnetometer. Field survey and data reduction. Preparation of magnetic anomaly maps. Aeromagnetic surveys.</p>	15
III	<p>3.1 Seismic prospecting: Fundamentals of seismic wave propagation, Methods of seismic prospecting and interpretation of seismic data.</p> <p>3.2 Basic principles of resistivity method. Resistivity survey. Application and interpretation of resistivity data. S. P. Method and interpretation of data obtained by S. P. Method.</p> <p>3.3 Radiometric prospecting and Borehole Logging. Radiometric survey, Application and interpretation of data.</p> <p>3.4 Borehole logging: Principles of various borehole-logging methods, Interpretation of data</p>	15
IV	<p>4.1 Methods of litho-geochemical and pedo-geochemical surveys.</p> <p>4.2 Methods of hydro-geochemical, atmo-geochemical and biogeochemical surveys.</p> <p>4.3 sample preparation</p> <p>4.4 Applications of Remote Sensing in Mineral Exploration</p>	15


M. Arif


A. Sha


SS Bhadauriya


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S Kerketta


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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

1. Arogyaswami, R.P.N. (1996): Courses in Mining Geology, Oxford and IBH Publ.
2. Bagchi, T.C., Sengupta, D.K., Rao, S.V.L.N. (1979): Elements of Prospecting and Exploration, Kalyani Publ.
3. Banerjee, P.K. and Ghosh, S. (1997): Elements of Prospecting for Non-fuel Mineral deposits, Allied Publ.
4. Chaussier, Jean – Bernard and Morer, J. (1987): Mineral Prospecting Manual., North Oxford Academic.
5. Dhanraju, R. (2005): Radioactive Minerals, Geol. Soc. India, Bangalore.
6. Rajendran, S. (2007): Mineral Exploration: Recent Strategies.
7. Sinha, R.K. and Sharma, N.L. (1976): Mineral economics, Oxford and IBH Publ.

Online Resources

<https://www.mooc-list.com/course/minerals-and-mining-business-edx>

PART -D:Assessment andEvaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

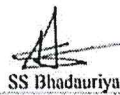
Continuous Internal Assessment(CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	


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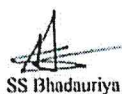
PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VII	
		Session:2024-2025	
1	Course Code	GESE-08P	
2	Course Title	MINERAL EXPLORATION	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> 1. Understand the megascopic & microscopic properties of ore minerals 2. Plotting of Ore deposits in map of India 	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) . Megascopic study of metallic and nonmetallic economic minerals. Description and identification, uses and distribution in India. 2. Description and identification of ore minerals in polished section of ores . 3. Study of ore textures and structure under the microscope. 4. Paragenetic study of ore minerals and construction of Paragenetic diagrams. 5. Location of important metallic and non-metallic mineral compels in a map of India. 6. Calculation of ore reserves and assay values. 7. Study and interpretations of Isopach and Isograde maps. Study of megascopic properties of ore mineral 8. study of geophysical methods for mineral exploration		30




M. Arif



A. Sha



SS Bhadauriya



SD Deshmukh



S Kerketta



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Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

8. Arogyaswami, R.P.N. (1996): Courses in Mining Geology, Oxford and IBH Publ.
9. Bagchi, T.C., Sengupta, D.K., Rao, S.V.L.N. (1979): Elements of Prospecting and Exploration, Kalyani Publ.
10. Banerjee, P.K. and Ghosh, S. (1997): Elements of Prospecting for Non-fuel Mineral deposits, Allied Publ.
11. Chaussier, Jean – Bernard and Morer, J. (1987): Mineral Prospecting Manual., North Oxford Academic.
12. Dhanraju, R. (2005): Radioactive Minerals, Geol. Soc. India, Bangalore.
13. Rajendran, S. (2007): Mineral Exploration: Recent Strategies.
14. Sinha, R.K. and Sharma, N.L. (1976): Mineral economics, Oxford and IBH Publ.

Online Resources

<https://www.mooc-list.com/course/minerals-and-mining-business-edx>

PART -D:Assessment andEvaluation -Practical

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks


End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:


M. Arif


A. Sha


SS Bhadauriya


S D Deshmukh


S Kerketta


S Vansutre


N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester: VIII	
		Session:2024-2025	
1	Course Code	GESE-09T	
2	Course Title	REMOTE SENSING & GIS	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	1) This course introduces recent technique of remote sensing that has wide application potential in several fields of surveying such as geological, geographical, agricultural, forestry etc. 2) The students will know about the interpretation of aerial remote sensing and its application potential in geological investigations 3) The Application of remote sensing and GIS in geomorphological investigations, tectonic investigations, lithological mapping, groundwater exploration, mineral exploration, Oil & Gas exploration and geohazard management	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1 Principles of Remote Sensing 1.2 Electromagnetic Spectrum, EMR Bands. 1.3 Interaction of EMR with atmosphere and earth surface features, 1.4 Atmospheric Window		15
II	2.1 Satellite – Classification on basis of Orbit, 2.2 Concept of radiometric, Spectral, Spatial and Temporal resolution of satellite. 2.3 Remote sensing sensors, 2.4 Data acquisition		15


 M. A. K. / A. Sha / SS Bhadauriya / S D. Deshmukh / S Kerketta / S Vansutre / N Bodhankar


III	3.1. Visual interpretation of Satellite data and its elements 3.2 Interpretation of topographic and tectonic features 3.3 Concept and physical basis of remote sensing: terrestrial, aerial and space platforms. 3.4 GIS – Definition, Component, Application and Limitations, GIS softwares, Applications of GIS in Geology	15
IV	4.1 Advantages and limitations, Satellite navigation – GNSS, GPS, DGPS with special reference to NavIC 4.2 Aerial photography, photographs and their geometry. Photogrammetry. 4.3 Indian Satellite mission with special reference to Indian extra-terrestrial missions. 4.4 Application of Remote Sensing in Geology, Geomorphology, Natural Resource Mapping, Urban Plannin, Mineral Exploration	15



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A. Sha



SS Bhadauriya



SD Deshmukh



S Kerketta



S Vansutre



N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Lillesand, T.M., Kiefer, R.W. and Chapman, J. (2015): Remote Sensing and Image Interpretation, 7th Edition. Wiley
- Gupta, R.P. (2003). Remote Sensing Geology. 2nd Edition. Springer
- Drury, S.A. (1993). Image Interpretation in Geology. 2nd Edition. Chapman & Hall
- Jensen, J.R. (2000). Remote Sensing of the Environment, An earth Resource Perspective. Pearson Education.
- DeMers M.N. (2008). Fundamentals of geographic Information System. 4th Edition. Wiley
- Richards, J.A. and Jia, X. (2006). Remote Sensing Digital Image Analysis: An Introduction. 4th Edition, Springer
- George Joseph (2005). Fundamentals of Remote Sensing 2nd edition: Universities Press
- Gopi, S, Sathikumar, R and Madhu, N (2006). Advanced Surveying total station GIS and Remote Sensing, Pearson Education
- Sabins, F.F. (2007). Remote Sensing Principles and Interpretations 3rd Edition, Waveland Pr Inc.
- Lilles T.M., Kiefer, R. W. and Chipman, J. (2008). Remote Sensing and Image Interpretation. 6th Edition, John Wiley and Sons.
- Bhatia, S.C. (2008). Fundamentals of Remote Sensing Atlantic Publications.
- Bhatta, B. (2011). Remote Sensing and GIS 2nd Edition, Oxford University Press
- Sabins, F.F. (2012). Remote Sensing Principles and Practice 3rd Edition, Levant Books
- Jensen, J.R. (2013). Remote Sensing of the Environment: An Earth Resource Perspective 2nd Edition, Pearson India.

Online Resources

<https://www.classcentral.com/course/swayam-photogeology-remote-sensing-45165>

PART -D: Assessment and Evaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks

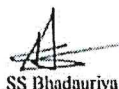
Continuous Internal Assessment (CIA): 30 Marks

End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	


M. Anil


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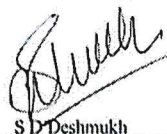

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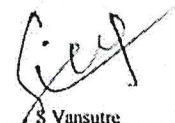
PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester: VIII	Session:2024-2025
1	Course Code	GESE-09P	
2	Course Title	REMOTE SENSING & GIS	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ol style="list-style-type: none"> 1. Understanding the interperation of satellite imageries 2. Studing aerial photographs using stereopair 	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	<ol style="list-style-type: none"> 1. Geomorphological, lithological, tectonic 2. Studying stereopair aerial photographs and using stereoscopes for identifying the phototechnical and geotechnical elements of different landforms 3. landuse / landcover classes in satellite imageries 		30









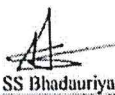




M. Amir



A. Sha



SS Bhaduriya



S D Deshmukh



S Kerketta



S Vansutre



N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- Lillesand, T.M., Kiefer, R.W. and Chapman, J. (2015): Remote Sensing and Image Interpretation, 7th Edition. Wiley
- Gupta, R.P. (2003). Remote Sensing Geology. 2nd Edition. Springer
- Drury, S.A. (1993). Image Interpretation in Geology. 2nd Edition. Chapman & Hall
- Jensen, J.R. (2000). Remote Sensing of the Environment, An earth Resource Perspective. Pearson Education.
- DeMers M.N. (2008). Fundamentals of geographic Information System. 4th Edition. Wiley
- Richards, J.A. and Jia, X. (2006). Remote Sensing Digital Image Analysis: An Introduction. 4th Edition, Springer
- George Joseph (2005). Fundamentals of Remote Sensing 2nd edition: Universities Press
- Gopi, S, Sathikumar, R and Madhu, N (2006). Advanced Surveying total station GIS and Remote Sensing, Pearson Education
- Sabins, F.F. (2007). Remote Sensing Principles and Interpretations 3rd Edition, Waveland Pr Inc.
- Lilles T.M., Kiefer, R. W. and Chipman, J. (2008). Remote Sensing and Image Interpretation. 6th Edition, John Wiley and Sons.
- Bhatia, S.C. (2008). Fundamentals of Remote Sensing Atlantic Publications.
- Bhatta, B. (2011). Remote Sensing and GIS 2nd Edition, Oxford University Press
- Sabins, F.F. (2012). Remote Sensing Principles and Practice 3rd Edition, Levant Books
- Jensen, JR. (2013). Remote Sensing of the Environment: An Earth Resource Perspective 2nd Edition, Pearson India.

Online Resources

<https://www.classcentral.com/course/swayam-photogeology-remote-sensing-45165>

PART -D: Assessment and Evaluation -Practical

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
	Assignment/Seminar +Attendance - 05 Total Marks - 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:










FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

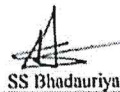
PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester: VIII	
		Session:2024-2025	
1	Course Code	GESE-10T	
2	Course Title	HYDROGEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	1) This course has a direct relationship to society as it provides a deep information regarding the most important factor required for a life to sustain i.e water.Groundwater is the purest form of water that can be yielded from rocks 2) It provides a better knowledge about its origin, prospecting and extraction of water 3) It explains the laws Governing ground water flow and various methods of ground water exploration..	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1 Scope of hydrogeology and its relation with hydrology, meteorology and their uses in the Hydrogeological investigation. 1.2 Hydrologic cycle. Role of groundwater in the hydrologic cycle. Hydrograph, data collection and analysis. 1.3 Composition of Sea water and River water. 1.4 Water table and piezometric surface. Water table fluctuation. Water table contour maps, interpretation and uses.		15


 M. Arif A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

II	<p>2.1 Water bearing formation types - aquifers, aquitard, aquiclude, aquifuse. Aquifer types: perched, unconfined, semi-confined and unconfined, isotropic, anisotropic.</p> <p>2.2 Porosity, permeability. Ground water movement: Darcy's law and its applications.</p> <p>2.3 Specific yield and specific retention. Storativity and transmissivity.</p> <p>2.4 Steady and unsteady flow, leaky aquifers. Groundwater flow near aquifer boundaries.</p>	15
III	<p>3.1 Geological and Hydrogeological methods of groundwater exploration.</p> <p>3.2 Geophysical methods – Electrical resistivity method for groundwater exploration</p> <p>3.3 Application of remote sensing in groundwater exploration.</p> <p>3.4. Basin wise development of groundwater with special reference to Chhattisgarh region</p>	15
IV	<p>4.1 Groundwater provinces of India.</p> <p>4.2 Sources of dissolved constituents in groundwater. Groundwater quality standards-drinking, domestic, agriculture and industry. Groundwater pollution.</p> <p>4.3 Groundwater management. Safe yield, overdraft and spacing of wells.</p> <p>4.4 Conservation of Groundwater; conjunctive use of water. Artificial recharge.</p>	15


M. Arif


A. Sha


SS Bhadauriya


SD Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

- D.K. Todd (1995): Groundwater Hydrology, John Wiley and Sons.
- F.G. Driscoll (1988): Groundwater and Wells, UOP, Johnson Div.St.Paul. Min. USA.
- H.M. Raghunath (1990): Groundwater, Wiley Eastern Ltd.,
- H.S. Nagabhushaniah (2001): Groundwater in Hydrosphere (Groundwater hydrology), CBS Publ..
- K. R. Karanth (1989): Hydrogeology, Tata McGraw Hill Publ..
- S.N. Davies and R.J.N. De Wiest (1966): Hydrogeology, John Wiley and Sons, New York
- C.F. Tolman (1937): Groundwater, McGraw Hill , New York and London.

Online Resources

<https://iah.org/>

PART -D:Assessment andEvaluation -Theory

Suggested Continuous Evaluation Methods:

Maximum Marks: 100 Marks
Continuous Internal Assessment(CIA): 30 Marks
End Semester Exam (ESE): 70 Marks

**Continuous
InternalAssessment
(CIA):
(By CourseTeacher)**

Internal Test / Quiz-(2): 20 +20
Assignment / Seminar - 10
Total Marks - 30

Better marks out of the two Test /
Quiz + obtained marks in
Assignment shall be considered
against 30 Marks

**End Semester Exam
(ESE):**

Two section – A & B

Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4
=20Marks

Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40
Marks

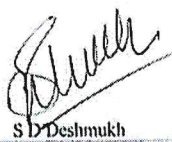

M. A. J. A. Sha SS Bhadauriya S D. Deshmukh S Kerketta S Vansutre N Bodhankar

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester: VIII	
		Session:2024-2025	
1	Course Code	GESE-10P	
2	Course Title	HYDROGEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand Hydrogeological properties of rocks. 2) Interpretation of water table maps 3) Understanding groundwater provinces of India 4) Understanding Hydrogeochemical data	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1.) Hydrogeological properties of rocks.		30
	2.) Interpretation of water table maps		
	3.) Interpretation of Hydrogeochemical data and their plotting in different diagrams		
	4.) Plotting of groundwater provinces on an outline map of India.		


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SS Bhadauriya


SD Deshmukh


S Kerketta

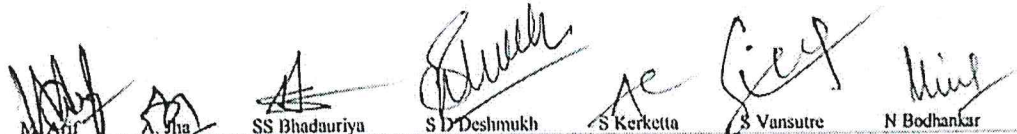

S Vansutre


N Bodhankar

Part - C	
Learning Resource: Text Books, Reference Books, Others	
Text Books Recommended-	
- D.K. Todd (1995): Groundwater Hydrology, John Wiley and Sons.	
- F.G. Driscoll (1988): Groundwater and Wells, UOP, Johnson Div.St.Paul. Min. USA.	
- H.M. Raghunath (1990): Groundwater, Wiley Eastern Ltd.,	
- H.S. Nagabhushaniah (2001): Groundwater in Hydrosphere (Groundwater hydrology), CBS Publ.	
- K. R. Karanth (1989): Hydrogeology, Tata McGraw Hill Publ..	
- S.N. Davies and R.J.N. De Wiest (1966): Hydrogeology, John Wiley and Sons, New York	
C.F. Tolman (1937): Groundwater, McGraw Hill , New York and London.	
Online Resources	
https://iah.org/	

PART -D:Assessment andEvaluation -Practical			
Suggested Continuous Evaluation Methods:			
Maximum Marks: 50 Marks			
Continuous Internal Assessment(CIA):15 Marks			
End Semester Exam (ESE): 35 Marks			
Continuous InternalAssessment (CIA):	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks	
(By Course Teacher)			
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment		Managed by Course teacher as per lab. status
	D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks		

Name and Signature of Convener & Members of CBoS:


 M. Arif A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VIII	
		Session:2024-2025	
1	Course Code	GESE-11T	
2	Course Title	MINERALS AND ITS USES IN INDUSTRY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	1) Understand the purpose of mineral processing and their importance to the world economy and sustainable use of raw materials (critical thinking). 2) Ability to work in multidisciplinary teams and solve technical and operational problems (problem solving skills). 3) Multicultural integration 4) Communication and entrepreneurial skills and others proposed in the T-shape education program	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1.1 Introduction to minerals in Construction industry 1.2. Limestone, clay, sand - sizing, building materials, road building 1.3. Durability of Granite - tile industries, railway 1.4. Minerals and rocks in Basement for mega engineering projects		15
II	2.1. Copper as a part of enzymes and iron metabolic 2.2. Fluoride involved in the formation of teeth and bones 2.3. Iodine in thyroid hormone and metabolism 2.4. Pharmaceutical uses minerals		15
III	3.1. Nitrogen(N)- Phosphorus (P)- Potassium (K) ratio 3.2. Fertilizer minerals 3.3. DAP fertilizer 3.4. Organic and inorganic fertilizers		15
IV	4.1. minerals in plastic and polymers 4.2. Glass making industry: chemicals and abrasive 4.3. Non-metallic minerals in electronic industries 4.4. use of magnesium in soaps and detergents		15


 M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C		
Learning Resource: Text Books, Reference Books, Others		
Text Books Recommended-		
5. Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers		
6. Ore Deposits Geology Jhon Ridley Cambridge University Press		
7. The Geology of Ore Deposits <u>GUILBERT J.M.</u> 2013 CBS Publisher		
8. ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre		
9. Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher		
10. Arogyaswami, R.P.N. (1996): Courses in Mining Geology, Oxford and IBH Publ.		
Online Resources		
https://www.mooc-list.com/course/minerals-and-mining-business-edx		
PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100 Marks		
Continuous Internal Assessment(CIA): 30 Marks		
End Semester Exam (ESE): 70 Marks		
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,1out of 2 from each unit-4x10=40 Marks	


M. Anil


A. Sha


SS Bhadauriya


SD Deshmukh

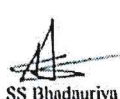

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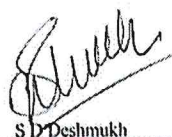

S Vansutre


N Bodhankar

PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester:VIII	Session:2024-2025
1	Course Code	GESE-11P	
2	Course Title	MINERALS AND ITS USES IN INDUSTRY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 3. Understand the megascopic & microscopic properties of ore minerals 4. Plotting of Ore mineral deposits in map of India	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) . Megascopic study of metallic and nonmetallic economic minerals. Description and identification, uses and distribution in India. 2. Description and identification of ore minerals in polished section of ores 3. Study of ore textures and structure under the microscope. 4. Location of important metallic and non-metallic mineral compels in a map of India.		30











Part - C		
Learning Resource: Text Books, Reference Books, Others		
Text Books Recommended-		
11. Ore Genesis - A Holistic Approach Asoke Mookherjee 1999 .Allied publishers 12. Ore Deposits Geology Jhon Ridley Cambridge University Press 13. The Geology of Ore Deposits <u>GUILBERT J.M.</u> 2013 CBS Publisher 14. ECONOMIC MINERAL DEPOSITS, 3RD Edn. Book Selection Centre 15. Economic Geology Economic Mineral Deposits 2Ed (Pb 2019) CBS Publisher 16. Arogyaswami, R.P.N. (1996): Courses in Mining Geology, Oxford and IBH Publ.		
Online Resources		
https://www.mooc-list.com/course/minerals-and-mining-business-edx		
PART -D:Assessment andEvaluation -Practical		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 50 Marks		
Continuous Internal Assessment(CIA):15 Marks		
End Semester Exam (ESE): 35 Marks		
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment G. Performed the Task based on lab. work - 20 Marks H. Spotting based on tools & technology (written) – 10 Marks I. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBOS:


 M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester:VIII	
		Session:2024-2025	
1	Course Code	GESE-12T	
2	Course Title	APPLIED GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	4) To provide the knowledge of geological investigation for site selection of engineering projects 5) To understand the rock type and their engineering properties, suitability of site conditions for Dam, tunnel, roads and highways 6) To develop concepts and applied aspects of geology in various civil or geo- engineering Projects 7) To impart knowledge of Geophysics and applications of physics in geology 8) To enhance knowledge and applications of geophysics in exploration of earth resources	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100(70+30)	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Introduction to Engineering Geology: Scope, Properties of rocks, Rock Discontinuity, Physical characters of building, Decorative stones and Concrete aggregates and road materials. Soils- Physical and Engineering Properties. Role of Engineering Geologists in Planning and Construction of Major Man Made Structural features. Dams: Foundation Treatment, Grouting, Rock Bolting, and Other Support Mechanisms. Types of geological conditions and site investigations, Important Indian dams. Reservoirs - Definition, Selection of Reservoir sites, Problems in Reservoirs, Sedimentations, Leakage and Seismicity. Short account on Indian reservoirs and Chhattisgarh reservoirs.		15


 M. Anil A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

II	Tunnels - Definition, Parts of Tunnel, Purpose and Types of Tunnelling. Methods of site and Geological investigations for Tunnelling and Tunnel profile. Geological investigations in Engineering sites. LANDSLIDES-Definition, Slope Stability, Slope failure and Safety, Slope Control, Geological factors, Groundwater conditions and Remedial measures. Mass Movements – Causes, Types, Monitoring and controls of mass Movements. Earthquakes -Definition-	15
	Terminology, Causes, Factors, and Preventive measures. Seismic zones of India, Seismic design of building. Case histories related to Indian Civil Engineering Projects.	
III	3.1 Definition and scope of Geophysics 3.2 Resistivity, Electrical conduction through rocks 3.3 Range of Resistivity for Rock Sand Minerals. 3.4 Measurement of Earth Resistivity: Measurement of Earth Resistance, Potential Distribution	15
IV	4.1 Seismic properties of rocks 4.2 Densities of various layers of earth (Lithosphere) 4.3 Distribution of density and pressure within Earth 4.4 Survey Procedure: Electrical Profiling, Resistivity Sounding (VES), Precautions.	15

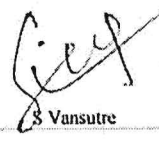

M. Anif


A. Sha


SS Bhadauriya


S D. Deshmukh


S Kerketta


S Vansutre


N Bodhankar

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

1. Bell, F.G. (2005), Fundamentals of Engineering Geology, B.S. Publications Hyderabad.
2. Krynine, P.D.& W.R. Judd (1956), Principles of Engineering Geology & Geotechnics, CBS, Delhi.
3. Legget, R.F.& A.W. Hatheway (1988), Geology and Engineering. 3 rdEd. McGraw Hill, New York.
4. Parbin Singh (2000), A textbook of Engineering and General Geology, S.K. Kataria and sons, Delhi.
5. Lowrie, W.F. (2008) Fundamentals of Geophysics, 2 nd edition, Cambridge University Press, Cambridge U.K.
6. Anderson, D.L. (2007) Theory of Earth, 2 nd edition, Cambridge University Press, Cambridge U.K., Holmes A.L. (revised by Duff & Others), (1995) Physical Geology, 5 th edition ELBS, London

Online Resources

- <https://www.classcentral.com/course/swayam-rock-mechanics-and-tunneling-43654>
- <https://www.classcentral.com/course/swayam-introduction-to-engineeringseismology-43605>
- <https://www.mooc-list.com/course/reservoir-geomchanics-edx>
- <https://www.mooc-list.com/course/geology-and-engineering-geologygongchengdezhixue-edx>

PART -D: Assessment and Evaluation -Theory

Suggested Continuous Evaluation Methods:


Maximum Marks: 100 Marks
Continuous Internal Assessment(CIA): 30 Marks
End Semester Exam (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1 out of 2 from each unit-4x10=40 Marks	


M. Anif


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PART-A: Introduction			
Program: Bachelor in Science(Certificate/Diploma/Degree)		Semester: VIII	Session:2024-2025
1	Course Code	GESE-12P	
2	Course Title	APPLIED GEOLOGY	
3	Course Type	Discipline Elective Course	
4	Pre-requisite(if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1. Understand the Engineering properties of Rock 2. Plotting of Dam and Tunnels on map of India	
6	Credit Value	1Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1. Understand the Engineering properties of Rock 2. Plotting of Dam and Tunnels on map of India		30






Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

7. Bell, F.G. (2005), Fundamentals of Engineering Geology, B.S. Publications Hyderabad.
8. Krynine, P.D.& W.R. Judd (1956), Principles of Engineering Geology & Geotechnics, CBS, Delhi.
9. Legget, R.F.& A.W. Hatheway (1988), Geology and Engineering, 3rd Ed. McGraw Hill, New York.
10. Parbin Singh (2000), A textbook of Engineering and General Geology, S.K. Kataria and sons, Delhi.
11. Lowrie, W.F. (2008) Fundamentals of Geophysics, 2nd edition, Cambridge University Press, Cambridge U.K.
12. Anderson, D.L. (2007) Theory of Earth, 2nd edition, Cambridge University Press, Cambridge U.K., Holmes A.L. (revised by Duff & Others), (1995) Physical Geology, 5th edition ELBS, London

Online Resources

- <https://www.classcentral.com/course/swayam-rock-mechanics-and-tunneling-43654>
- <https://www.classcentral.com/course/swayam-introduction-to-engineeringseismology-43605>
- <https://www.mooc-list.com/course/reservoir-geomchanics-edx>
- <https://www.mooc-list.com/course/geology-and-engineering-geologygongchengdezhixue-edx>

PART -D: Assessment and Evaluation -Practical

Suggested Continuous Evaluation Methods:


Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment J. Performed the Task based on lab. work - 20 Marks K. Spotting based on tools & technology (written) – 10 Marks L. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBOS:

 M. Arif	 A. Sha	 SS Bhaduriya	 S D Deshmukh	 S Kerketta	 S Vansutre	 N Bodhankar
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FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: I	Session:2024-2025
1	Course Code	GEGE-01T	
2	Course Title	Fundamentals of Geology	
3	Course Type	Generic Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand basics of Geology, Solar system and internal structure of the Earth, origin and age of the Earth • Understand the theories of continental drift and plate tectonics • Understand causes and effects of earthquakes and explain weathering and its products • Describe concepts of geomorphology and landforms developed by various geological agencies • Explain about the physiographic and tectonic divisions of India 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40

PART- B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)

Unit	Topics (Course Contents)	No. of Period
I	General Geology & Geodynamics: Introduction to Geology; Geology and its relation with other branches of science; Earth and solar system; Theories regarding origin and age of the Earth; Shape and structure of the Earth; Introduction to Continental Drift, Sea-floor spreading & Plate Tectonics. Introduction to Geomorphology: Definition of Geomorphology; Erosional & Depositional features of various Geomorphological Agents (River, Wind and Glacial).	15
II	Structural Geology: Its definition; Attitude of Beds (Dip and Strike). Introduction to Fold, Fault and Joints. Economic Geology: Its definition, Introduction to important Indian mineral deposits (metallic and non-metallic). Introduction to important ore forming processes (magmatic, hydrothermal, supergene sulphide enrichment, mechanical concentration)	15
III	Stratigraphy: Its definition, Principles of Stratigraphy, Types of Correlation, Geological Time Scale. Palaeontology: Its definition, Fossil, Mode of Preservation, Uses of Fossil, Index Fossil	15
IV	Applied Geology: Definition and Scope of Hydrogeology. Definition and Scope of Engineering Geology. Definition and Scope of Mining Geology. Definition and Scope of Environmental Geology, Definition and Scope of Mineral Exploration	15



 N. A. ... A. ... SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

1. भौतिक-भूविज्ञान-डॉ. मुकुल घोष
2. भौतिक-भूविज्ञान-डॉ. जे.पी. तिऱारी ँिबी. के. स ंह
3. भूआकृतिविज्ञान-डॉ. विन्द्र स ंह
4. भूविज्ञान एक पररचय डॉ. विद्या ागरदुवे
5. भूगतिकी ँिभूआकृतिविज्ञान-डॉ. दीपकरजतिऱारी

Reference Books

6. Holmes, A. Doris L Holmes Edit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
7. Mahapatra, G.B., Text book of Physical Geology, CBS, India, 2018
8. Mathur, S.M., Physical Geology of India, NBT India, 1991 9. Miller, William J., Physical Geology: An Introduction. D Van Nostrand Co., 5th Ed., 1949
9. Mukerjee, P.K., Text Book of Geology. World Press Private Ltd, 2013.
10. Thornbury, W.D., Principles of Geomorphology. New Age International, 2nd Edition, 196 12. Principles of Geomorphology: A.F. Ahmad


E-resources

1. <https://opentextbc.ca/physicalgeology2ed/front-matte/rdownload-a-pdf/>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://egpg.inflibnet.ac.in>

PART -D:Assessment andEvaluation -Theory**Suggested Continuous Evaluation Methods:**

Maximum Marks:	100 Marks
Continuous Internal Assessment(CIA):	30 Marks
End Semester Exam (ESE):	70 Marks

Continuous Internal Assessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts., 1out of 2 from each unit-4x10=40 Marks	

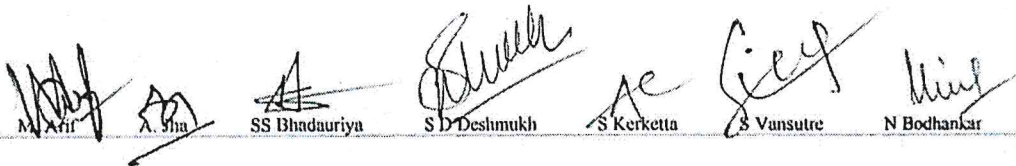

M. Arif
A. Jha
SS Bhadauriya
S D Deshmukh
S Kerketta
S Vansutre
N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: I	Session:2024-2025
1	Course Code	GEGE-01P	
2	Course Title	Lab. Course -01 (Fundamentals of Geology)	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Identify and describe various landforms in geomorphologic models. • Interpret topographical maps 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1. Physical properties of minerals. 2. Introduction to Clinometer Compass and its use. 3. Study of Geomorphological Models.		30



 M. Arif A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books Recommended-**

1. भौतिक-भूविज्ञान-डॉ. मुकुल घोष
2. भौतिक-भूविज्ञान-डॉ. जे.पी. तिरी एम्बी. के. संह
3. भूआकृतिविज्ञान-डॉ. विन्द्र संह
4. भूविज्ञान एक परचय डॉ. विद्या ागदुबे
5. भूगतिकी एिभूआकृतिविज्ञान-डॉ. दीपकरजतिरी

Reference Books

6. Holmes, A. Doris L Holmes Edit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
7. Mahapatra, G.B., Text book of Physical Geology, CBS, India, 2018
8. Mathur, S.M., Physical Geology of India, NBT India, 1991 9. Miller, William J., Physical Geology: An Introduction. D Van Nostrand Co., 5th Ed., 1949
9. Mukerjee, P.K., Text Book of Geology. World Press Private Ltd, 2013.
10. Thornbury, W.D., Principles of Geomorphology. New Age International, 2nd Edition, 196 12. Principles of Geomorphology: A.F. Ahmad

E-resources

1. <https://opentextbc.ca/physicalgeology2ed/front-matte/rdownload-a-pdf/>
2. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
3. <https://egyankosh.ac.in/>
4. <https://sites.google.com/ignou.ac.in/bscgeology>
5. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
6. National digital library <https://ndl.iitkgp.ac.in>
7. e-PG pathshala (MHRD) portal, <https://egpg.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBos:









FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: II	Session:2024-2025
1	Course Code	GEGE-02T	
2	Course Title	Essentials of Geology	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Explain about the basics of crystallography, various crystal forms, crystallographic axes and symmetry elements. • Describe various forms of normal classes of various crystal systems. Classify the minerals in various silicate groups and explain their varieties. • Describe the physical properties of various minerals. • Describe the optical characteristics of various minerals. 	
6	Credit Value	3 Credits	(Credit=15 hours-learning & observation)
7	Total Marks	Max. Marks: 100	Min Passing Marks : 40
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 45 Periods (45 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	Mineralogy: Definition of Mineral, Mineral Classification (Ore forming, rock forming, metallic & Non-metallic etc.). Physical, chemical and optical properties of minerals.		15
II	Crystallography: Definition of Crystal, Crystal Lattice, Classification of Crystal System. Silicate Structure and its types along with mineral examples.		15
III	Petrology: Rock Cycle. Types and Mode of formation of different Rocks (Igneous, Metamorphic and Sedimentary) and their properties. Texture and Structure of Igneous, Metamorphic and Sedimentary rocks.		15
IV	Tabular Classification Igneous Rocks. Classification of Sedimentary Rocks: Clastic, non-Clastic and Biogenic. Types and Agents of Metamorphism.		15


 M. Anil A. Sha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others****Text Books**

1. खतनजिथाक्रिस्टलविज्ञान-डॉ.बी. ी. जैश
2. खतनजविज्ञान के सद्ांि डॉ. ए.पी. अग्रवाल
3. प्रकाशीय खतनजविज्ञान के मूलत्ि-विचेल
4. खतनजिथाक्रिस्टलविज्ञान-डॉ. दीपकराजतििारी

Reference Books

5. Gribble, C.D. Rutley's Elements of Mineralogy. CBS, 2005.
6. Ford W.E.; Dana's Text Book of Mineralogy. CBS, 2006.
7. Perkins, D.; Mineralogy, Prentice Hall India, 3rd ed. 2012.
8. Rathore, B.S.; Basics of Crystallography, Mineralogy and Geochemistry. Notion Press India, 2020
9. Sharma, R.S. and Sharma, Anurag; Crystallography and Mineralogy - Concepts and Methods. Geol. Soc. Ind., Bengaluru, 2013.

e-resources:

1. <https://www.mindat.org>
2. <https://www.mooc-list.com/tags/minerals>
3. <https://egpg.inflibnet.ac.in/Home>
4. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
5. <https://egyankosh.ac.in/>
6. <https://sites.google.com/ignou.ac.in/bscgeology>
7. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
8. National digital library <https://ndl.iitkgp.ac.in>
9. e-PG pathshala (MHRD) portal, <https://egpg.inflibnet.ac.in>

PART - D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks End

Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment A. Performed the Task based on lab. work - 20 Marks B. Spotting based on tools & technology (written) - 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

Signature of Convener & Members (CBoS) :

M. Anil A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: II	Session:2024-2025
1	Course Code	GEGE-02P	
2	Course Title	Lab. Course –02 (Essentials of Geology)	
3	Course Type	Discipline Elective Course	
4	Pre-requisite (if any)	As per program	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: <ul style="list-style-type: none"> • Understand the megascopic properties of Quartz and Feldspar group of minerals • Understand the megascopic properties of pyroxene group of minerals • Understand megascopic properties of Amphibole group of minerals • Describe the megascopic properties of olivine and Mica group of Minerals. • Describe microscopic identification of minerals. • Identify the various crystal Systems and Symmetry through crystal models • Assess the miller Indices of the crystal models • Identify Twining in crystals. 	
6	Credit Value	1 Credit	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 20
Part B: Content of the Course			
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)			
Module	Topics (Course contents)		No. of Period
Lab./Field Training/ Experiment Contents of Course,	1) Microscopic study of minerals and rocks. 2) Plotting of important mineral deposits on the outline map of India.		30


 M. A. H. A. Sha S. S. Bhadauriya S. D. Deshmukh S. Kerkeita S. Vansutre N. Bodhankar

Part - C: Learning Resource**Text Books, Reference Books, Others**

1. खतनजिथाक्रिस्टलविज्ञान-डॉ.जी. ी. जैश
2. खतनजविज्ञान केस द्ांि डॉ. ए.पी. अग्राल
3. प्रकाशीय खतनजविज्ञान के मूलित्-विचेल
4. खतनजिथाक्रिस्टलविज्ञान-डॉ. दीपकराजतििारी
5. Gribble,C.D. Rutley'sElementsofMineralogy.CBS,2005.
6. FordW.E.;Dana's TextBookof Mineralogy.CBS, 2006.
7. Perkins, D.; Mineralogy, Prentice HallIndia, 3rded.2012.
8. Rathore, B.S.; BasicsofCrystallography, MineralogyandGeochemistry. Notion Pressin dia,2020
9. Sharma, R.S.andSharma, Anurag; CrystallographyandMineralogy- ConceptsandMethods. Geol.Soc. Ind., Bengaluru, 2013.

e-resources:

1. <https://www.mindat.org>
2. <https://www.mooc-list.com/tags/minerals>
3. <https://egpp.inflibnet.ac.in/Home>
4. <https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up>
5. <https://egyankosh.ac.in/>
6. <https://sites.google.com/ignou.ac.in/bscgeology>
7. SWAYAM-<https://swayam.gov.in/explorer?searchtext>
8. National digital library <https://ndl.iitkgp.ac.in>
9. e-PG pathshala (MHRD) portal, <https://egpp.inflibnet.ac.in>

PART -D: Assessment and Evaluation**Suggested Continuous Evaluation Methods:**

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks End

Semester Exam (ESE): 35 Marks

Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance - 05 Total Marks -15	Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Laboratory / Field Skill Performance: On spot Assessment D. Performed the Task based on lab. work - 20 Marks E. Spotting based on tools & technology (written) – 10 Marks F. Viva-voce (based on principle/technology) - 05 Marks	Managed by Course teacher as per lab. status

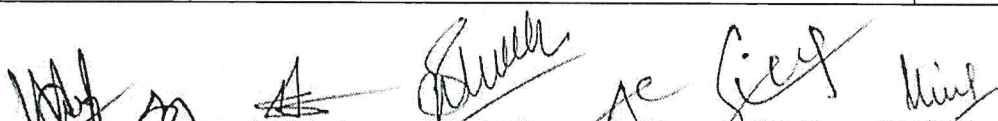
Name and Signature of Convener & Members of CBoS:

M. Anil A. Sha SS Bhadauriya SD Deshmukh S Kerketta S Vansutre N Bodhanekar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: I/III/V	Session:2024-2025
1	Course Code	GEVAC -01	
2	Course Title	DISASTER MANAGEMENT	
3	Course Type	Value Addition Course	
4	Pre-requisite(if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	<p>On completion of Course, the students should be able to-</p> <ol style="list-style-type: none"> 1.) Appropriate actions at all points in the cycle lead to greater preparedness, better warnings, reduced vulnerability or the prevention of disasters during the next iteration of the cycle. 2.) The complete disaster management cycle includes the shaping of public policies× and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure. 3.) Capacity to obtain, analyze, and communicate information on risks, relief needs and lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them 	
6	Credit Value	2 Credits	(Credit=30 hours-learning & observation)
7	Total Marks	Max. Marks: 50	Min Passing Marks : 20
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 30 Periods (30 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1) Meaning & Definition of Natural Disaster 2) Earthquake 3) Active fault 4) Volcanoes 5) Landslide - Types, avalanches		15
II	1) Heatwave, Wild fires 2) Cloud Burst , Hailstorm 3) Drought and Famine 4) Tsunami, Hurricane, Cyclone 5) Flood , Glacial Outburst Flood, Flash flood		15


 M. A. H. A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C	
Learning Resource: Text Books, Reference Books, Others	
Text Books Recommended-	
1. Natural Hazards and Disaster Management: Vulnerability and Mitigation <u>R B Singh</u> Rawat Publications 2006	
2. Natural Disaster Management <u>Soumitra Roy</u> 2006 Abhijeet Publications	
3. Disaster Management Challenges and strategies of India , Dr. M. C. Shibin Tad Notion Press 2021	
Online Resources	
https://guides.loc.gov/natural-disasters/internet-resources	

PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks:		50 Marks
Continuous Internal Assessment(CIA):		15 Marks
End Semester Exam (ESE):		35 Marks
Continuous InternalAssessment (CIA): (By CourseTeacher)	Internal Test / Quiz-(2): 5+5 Assignment / Seminar - 5 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x2=10Marks Section B: Descriptive answer type qts.,5out of 3 from each unit-3x5=15 Marks	

Name and Signature of Convener & Members of CBoS:

						
N. Athi	A. Sha	SS Bhadauriya	S D Deshmukh	S Kerketta	S Vansutre	N Bodhankar

FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/Honors)		Semester: II/IV/V/V	
		Session:2024-2025	
1	Course Code	GESEC -01	
2	Course Title	RAINWATER HARVESTING	
3	Course Type	Skill Enhancement Course (SEC)	
4	Pre-requisite(if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	<p>On completion of Course, the students should be able to</p> <ol style="list-style-type: none"> 1. Define key rainwater harvesting concepts, terms, and principles 2. Assess a site for rainwater harvesting potential and water uses 3. Make strategic decisions about what features and systems to use for a site 4. Design a conceptual integrated rainwater harvesting plan for a site 5. Refine a conceptual rainwater harvesting plan with relevant systems details 	
6	Credit Value	2 Credits	(Credit=30 hours-learning & observation)
7	Total Marks	Max. Marks: 50	Min Passing Marks : 20
PART- B: CONTENT OF THE COURSE			
Total No. of Teaching-learning Periods (01 hour per period)- 30 Periods (30 Hours)			
Unit	Topics (Course Contents)		No. of Period
I	1) Water and its distribution 2) Water cycle 3) Rain Water Harvesting – Concepts & Terms 4) Rain Water Harvesting system		15
II	1) Selection Procedure for Rain Water Harvesting Site 2) Rain Water Runoff, Runoff Coefficient, Infiltration 3) Roof Rain Water Harvesting system 4) Government Policies regarding Rain Water Harvesting system		15


 M. Arif A. Jha SS Bhadauriya S D Deshmukh S Kerketta S Vansutre N Bodhankar

Part - C	
Learning Resource: Text Books, Reference Books, Others	
Text Books Recommended-	
1. CPWD Rain Water Harvesting & Conservation Manual –2022 Prabhakar Singh A Puri Publication	
2. Rainwater Harvesting for Drylands and Beyond, Volume 1, 3rd edition” Rainsource Press. 2019 Lancaster, Brad	
3. Rainwater Harvesting : In Urban Centers within the Hard Rock Terrain of the Deccan Basalt of India , Dr. Anil LALWANI Springer International Publishing AG 2021	
Online Resources	
http://www.rainwaterharvesting.org/	

PART -D:Assessment andEvaluation -Theory		
Suggested Continuous Evaluation Methods:		
Maximum Marks:	50 Marks	
Continuous Internal Assessment(CIA):	15 Marks	
End Semester Exam (ESE):	35 Marks	
Continuous InternalAssessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 5+5 Assignment / Seminar - 5 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x2=10Marks Section B: Descriptive answer type qts.,5out of3 from each unit-3x5=15 Marks	

Name and Signature of Convener & Members of CBoS:

 M. Arif	 A. Jha	 SS Bhadauriya	 S D. Deshmukh	 S Kerketta	 S Vansutre	 N Bodhankar
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