अध्ययन मंडल बैठक दिनांक 16/07/2025

विषय - भूगर्भ शास्त्र

विश्वविद्यालय अन्तर्गत संचालित एम.एस.सी. भूगर्भ शास्त्र प्रोग्राम में केन्द्रीय अध्ययन मंडल द्वारा तैयार किये गये चार वर्षीय स्नातक प्रोग्राम के पाठ्यक्रम को राष्ट्रीय शिक्षा नीति 2020 के अनुरूप स्नातकोत्तर प्रोग्राम के तृतीया एवं चतुर्थ रोमेस्टर में लागू करने की निम्नानुसार अनुशंसा की जाती है: -

Program: M.Sc. Geology									
Course Type	Course Code	Course Title	Paper	Semester	Credits	Max Marks	Min Marks	CIA	ESE
Third Semester									
DSC	GESC-09T	Palaeontology and Evolution of Life	T	III	3	100	40	30	70
DSC	GESC-09P	Lab. Course I	P	III	1	50	20	15	35
DSE	GESC-21T	Fuel Geology and Energy Resources	T	III	4	100	40	30	70
DSE	GESC-22T	Geomorphology	T	III	4	100	40	30	70
DSE	GESC-23T	Remote Sensing and GIS	T	III	4	100	40	30	70
DSE	GESC-24T	Mineral Exploration	T	III	3	100	40	30	70
DSE	GESC-24P	Lab Course II	P	III	1	50	20	15	35
Forth Semester									
DSC	GESC-10T	Mining, Ore Beneficiation and Engineering Geology	T	IV	4	100	40	30	70
DSE	GESC-25T	Environmental Geology and Disaster Management	T	IV	4	100	40	30	70
DSE	GESC-26T	Climatology And Oceanography	T	IV	4	100	40	30	70
DSE	GESC-27T	Hydrogeology	T	IV	3	100	40	30	70
DSE	GESC-27P	Lab. Course 1	P	IV	1	50	20	15	35
DSE	GESC-28P	Project Oriented Dissertation and **report writing (review of literature, methodology, research design, presentation, viva-voce)**	P	IV	4	150	60	50	100

क्र.	नाम	पदनाम	अध्यक्ष/सदस्य	हस्ताक्षर
1.	A. S. JHA.	A.P.	CHAIRMAN	Ajh 16/7/25

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSC-GESC -9PT**	
2	Course Title	**PALEONTOLOGY AND EVOLUTION OF LIFE**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand modes of fossilization and uses of fossils. 2) Identify Gondwana plant fossils. 3) Describe morphology, geological distribution of Brachiopods, Lamellibranches, 4) Describe morphology, geological distribution of Trilobites, Gastropods, Graptolites and Echinoids 5) 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:** 1.1 Paleontology: Fossils - definition, essentials and modes of fossilization. Uses of fossils, Leaked fossils and Derived fossils, 1.2 Index fossils & their significance, 1.3 Use of Paleontology in Stratigraphy, Paleoecology & Paleogeography, 1.4 Mass extinction, Theory of organic Evolution	11
II	**Paleontology:** 2.1 Morphology, classification, evolution and Geological distribution of Brachiopoda fossils, 2.2 Morphology, classification, evolution and Geological distribution of Lamellibranchia fossils, 2.3 Morphology, classification, evolution and Geological distribution of Gastropoda 2.4. Morphology, classification, evolution and Geological distribution of Cephalopoda,	11
III	**Paleontology:** 3.1 Morphology, classification, evolution and Geological distribution of Echinoidea, 3.2 Morphology, classification, evolution and Geological distribution of Trilobite 3.3 Morphology, classification, evolution and Geological distribution of Graptolite fossils. 3.4 Morphology, classification, evolution and Geological distribution of Rugos Corals.	11
IV	**Paleontology:** 4.1 Elementary idea about the origin of major group of vertebrates 4.2 Evolution of Horse and Elephants 4.3 Evolution of Man 4.4 General study of Siwalik mammalian fauna	12

Part - C
Learning Resource: Text Books, Reference Books, Others
Text Books Recommended- - Invertebrate Palaeontology- H.Woods. - Introduction to Palaentology- 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://egpg.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.,**1out of 2** from each unit-**4x10=40 Marks**	

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 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

Prof. A.S. Jha -Chairman

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSC-GESC -09P**	
2	Course Title	**Lab Course – I**	
3	Course Type	Discipline Specific Course (practical)	
4	Pre-requisite (if any)	As per Government norms	
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	Credit-1	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 17

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 5. Identification and interpretation of drainage patterns 6. Drawing of labeled diagrams of landforms 7. Determination of stream order, bifurcation ratio, drainage density, stream frequency. infiltration number.	30

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 Ajl

Prof. A.S. Jha -Chairman

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction				
Program: Masters in Geology		**Semester: III**		**Session:2025-2026**
1	Course Code	**DSE-GESC -21T**		
2	Course Title	**FUEL GEOLOGY AND ENERGY RESOURCE**		
3	Course Type	Discipline Specific Course (Theory)		
4	Pre-requisite (if any)	As per Government norms		
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	Credits 4	(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 Study of Microfossils and its significance, Morphology, classification, evolution and Geological distribution of Foraminifera 1.2 Study of Gondwana plant fossils 1.3 Definition and origin of coal 1.4 Classification of coal, Rank and Grading of coal	15
II	2.1 Fundamentals of coal petrology - Introduction to lithotypes, micro lithotypes and macerals in coal. 2.2 Proximate and ultimate analysis of coal 2.3. Coal Bed Methane (CBM) : global and Indian scenario 2.4. Distribution of coal: geological and geographical	15
III	3.1 Origin, Migration and Entrapment of petroleum 3.2. Properties of source and reservoir rock 3.3 Structural, Stratigraphic and Combination Traps. 3.4. Methods of petroleum exploration. Oil bearing basins of India.	15
IV	1. Nuclear and non-conventional energy resources. 2. Mode of Occurrence and Association of atomic minerals in nature. 3. Mineralogy of atomic minerals 4. Atomic minerals deposits of India	15

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

* Barker,C.(1996):ThermalModelingofPetroleumGeneration,ElsevierScience.
* Jahn,F.,Cook,M.and Graham,M.(1998): Hydrocarbon Exploration and Production, Eslevier 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, AcademicPress.
* Tissot,B.P.andWelte,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, Blackwel Scientifics Publications.
* IsabelSuárez RuizJohnCrelling .(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, NewDelhi.
* Stach,E., Mackowsky,M-Th., Taylor,G.H., Chandra,D., Teichumullelr,M. and Teichmulle, 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–Verlalg.
* 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 Hoorwool.
* 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

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):	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
(By CourseTeacher)		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 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

Prof. A.S. Jha -Chairman

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSE-GESC-22T**	
2	Course Title	**GEOMORPHOLOGY**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand weathering and its products 2) Describe concepts of geomorphology and landforms developed by various geological agencies 3) Explain about the physiographic and tectonic divisions of India	
6	Credit Value	Credits 4	(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 Geomorphic concepts 1.2 Geomorphic cycle. 1.3 Geomorphic processes – Agents and Weathering, soil-processes, 1.4 Mass-Wasting.	15
II	2.1 Valley development, 2.2 Cycle of erosion, rejuvenation. 2.3. Concept of morphometric analysis 2.4 Drainage patterns and their significance	15
III	3.1 Geological work of rivers; fluvial landforms (Erosional and depositional) 3.2 Geological work of ground water and karst topography (Erosional and depositional) 3.3 Geological work of wind Aeolian landforms (Erosional and depositional) 3.4 Geological work of Glaciers; glacial land forms (Erosional and depositional)	15
IV	4.1. Geological work of oceans; coastal landforms (Erosional and depositional) 4.2 Volcanic landforms, 4.3 Geomorphic region of India 4.4 Principles of terrain analysis	15

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

1. 1 Holmes, A. Doris L Holmes Edit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
2. Mahapatra, G.B., Text book of Physical Geology, CBS, India, 2018
3. 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
4. Mukerjee, P.K., Text Book of Geology. World Press Private Ltd, 2013.
5. 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 -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 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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSE-GESC -23T**	
2	Course Title	**REMOTE SENSING AND GIS**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 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	Credits - 4	(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 Thermal resolution of satellite. 2.3 Remote sensing sensors, 2.4 Data acquisition	15
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, hydrogeology, Geomorphology, Natural Resource Mapping, Urban Planning, Mineral Exploration	15

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,7thEdition.Wiley
- Gupta,R.P.(2003).Remote Sensing Geology.2ndEdition.Springer
- Drury,S.A.(1993).Image Interpretation in Geology.2ndEdition.Chapman & Hall
- Jensen,J.R.(2000).Remote Sensing of the Environment, An earth Resource Perspective. Pearson Education.
- DeMersM.N.(2008).Fundamentals of geographic Information System.4thEdition.Wiley
- Richards,J.A. and Jia,X.(2006).Remote Sensing Digital Image Analysis: An Introduction. 4thEdition,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, PearsonEducation
- Sabins,F.F.(2007).Remote Sensing Principles and Interpretations 3rd Edition, Waveland Pr Inc.
- LillesT.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 Resourses

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 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 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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSE-GESC-24T**	
2	Course Title	**MINERAL EXPLORATION**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	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. This course will surely help the students for opting carrier in the field of mineral prospection, exploration, and mining industry.	
6	Credit Value	Credits 3	(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, 1.4. Sampling: General principles, various methods and procedures, Average assays, weighting of samples, salting. Precautions.	11
II	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. 2.2 Gravity Method of prospecting: Basic principles of gravimeter. Gravity field surveys. Various types of corrections applied to gravity data. 2.3 Preparation of gravity anomaly maps. And their interpretation in terms of shape, size and depth 2.4 Magnetic method of prospecting: Magnetic properties. Magnetic anomaly. Magnetometer. Field survey and data reduction. Preparation of magnetic anomaly maps. Aeromagnetic surveys.	11

III	3.1 Seismic prospecting: Fundamentals of seismic wave propagation, Methods of seismic prospecting and interpretation of seismic data. 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. 3.3 Radiometric prospecting. Radiometric survey, Application and interpretation of data. 3.4 Borehole logging: Principles of various borehole-logging methods, Interpretation of data	11
IV	4.1 Forms of dispersion elements, factors affecting dispersion pattern. 4.2 Methods of lithogeochemical and pedogeochemical surveys, 4.3 Methods of hydro-geochemical, atmogeochemical and biogeochemical surveys. 4.4 Case study of regional exploration for deposition of plutonic association and vein and replacement type	12

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: III**	**Session:2025-2026**
1	Course Code	**DSE-GESC -24T**	
2	Course Title	**Lab course - II**	
3	Course Type	Discipline Specific Course (practical)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1. Understanding exploration of minerals by various geophysical and geochemical process 2. Interpret isopach and isograde maps and ore reserve calculation 2. Identify and describe various landforms in geomorphologic models. 3. Interpret topographical maps 4. Understanding the interoperation of satellite imageries 5. aerial photographs using stereopair	
6	Credit Value	Credit-1	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 17

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 Calculation of ore reserves and assay values. 2. Study and interpretations of Isopach and Isograde maps. 3. Interpretation of Geophysical and geochemical anomaly maps. 4. Numerical problems based on Geophysical and geochemical data. 5. Study of aerial photographs and satellite imageries and identification of landforms	30

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 Resourses

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

<table>
<tr><td colspan="4">PART -D: Assessment and Evaluation -Theory</td></tr>
<tr><td colspan="4">Suggested Continuous Evaluation Methods:
Maximum Marks: 100 Marks
Continuous Internal Assessment (CIA): 30 Marks
End Semester Exam (ESE): 70 Marks</td></tr>
<tr><td>Continuous InternalAssessment (CIA): (By CourseTeacher)</td><td colspan="2">Internal Test / Quiz-(2): 20 +20
Assignment / Seminar - 10
Total Marks - 30</td><td>Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks</td></tr>
<tr><td>End Semester Exam (ESE):</td><td colspan="3">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</td></tr>
<tr><td colspan="4">PART -D:Assessment andEvaluation -Practical</td></tr>
<tr><td colspan="4">Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment(CIA):15 Marks End Semester Exam (ESE): 35 Marks</td></tr>
<tr><td>Continuous Internal Assessment</td><td colspan="2">Internal Test / Quiz-(2): 10 & 10
Assignment/Seminar +Attendance - 05
Total Marks -15</td><td>Better marks out of the two Test / Quiz +obtained marks in Assignment shall be considered against 15 Marks</td></tr>
<tr><td>(CIA): (By Course Teacher)</td><td colspan="2"></td><td></td></tr>
<tr><td>End Semester Exam (ESE):</td><td colspan="2">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</td><td>Managed by Course teacher as per lab. status</td></tr>
</table>

M.Sc. IV SEMESTER

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSC-GESC-10T**	
2	Course Title	**MINING, ORE BENEFICIATION AND ENGINEEING GEOLOGY**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1. Understand mining terms and methods 2. Understand ore beneficiation 3. Understand about mega engineering projects	
6	Credit Value	4 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 Definition of mining terms: pitting, trenching, panning, adits, tunnels, and shafts. Subsidence and rock bursts, mine supports, Ventilation and drainage. 1.2. Role of geologist in mining industry. 1.3 Strata control in different rocks and structures, Geological structures of ore deposits and choice of mining methods. 1.4. Open pit mining- geologic and geomorphic conditions, different methods of opencast mining, advantages and limitations.	15
II	2.1 Underground mining methods- gophering, shrinkage, stoping, caving and slicing sublevel, over hand, under hand methods. 2.2 Coal mining methods, long wall, board and pillar. 2.3 General principles, scope and properties of mineral and rocks as applied to mineral dressing 2.4 Principles and methods of screening	15
III	3.1 Primary and secondary breaking, crushing and grinding. 3.2 concentration Method, hand sorting, washing, jigging, tabling heavy fluid. 3.3 Magnetic and electrostatic methods of separation of minerals. 3.4 floatation methods – principles and techniques with example.	15
IV	4.1 Engineering properties of rocks and soil. Physical characters of building stones. 4.2 Dam: definition, use its type, Site selection and Geological considerations for evolution of Dam and reservoir. Dam foundation problems. 4.3 Tunnel: definition, use, Geological considerations for evolution of Tunnel. Methods of Tunneling, TBM. 4.4 Case study of engineering projects, geological causes for mishaps and failure of engineering structures.	15

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

Dobrin, M. B.; Savit, C. H. (1988): Introduction to Geophysical Prospecting, McGraw-Hill.

Keary, P., Brooks, M. and Hill, I. (2002): An introduction to geophysical exploration. (3rd Ed.), Blackwell.

Krynine, D.H. and Judd, W.R. (1998): Principles of Engineering Geology, CBS Publ..

Rider, M. H. (1986): Whittles Publishing. Caithness. The Geological Interpretation of Well Logs, (Rev. Ed.).

Schultz, J.R. and Cleaves, A.B. (1951): Geology in Engineering, John Willey and Sons. New York.

Singh, P. (1994): Engineering and General Geology, S.K. Kataria and Sons, Delhi.

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.,**1out of 2** from each unit-**4x10=40 Marks**	
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 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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSE-GESC -25T**	
2	Course Title	**ENVIRONMENTAL GEOLOGY AND DISASTER MANAGEMENT**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1. Understand environmental geology and environment hazards and how to manage disasters 2. Understand about man-made disasters and remedies	
6	Credit Value	Credits - 4	(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 Interaction of man and natural system 1.4 Environmental laws, environmental policies of the government for air and water pollution.	15
II	2.1 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 brief introduction about the man-made disaster, such as nuclear, industrial accidents, environmental disaster, fires, rail accidents, road accidents, air accidents and sea accidents their causes and impacts.	15
III	Natural hazards measure and mitigation: - 3.1 Landslides, volcanic activity, earthquake 3.2 river flooding, cyclones, tsunami, 3.3 Erosion and coastal erosion 3.4 Marine transgression and regression	15
IV	4.1 Drought and Desertification 4.2 Human modification of nature in surface and subsurface by engineering construction Dams, Reservoirs, Bridges and Buildings. 4.3 Human settlement and contamination of atmosphere, soil, surface water and ground water by waste disposal and agro industries 4.4 environmental problems by mining activities, Global warming, Ozone layer depletion	15

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**	

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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSE-GESC -26T**	
2	Course Title	**CLIMATOLOGY AND OCEANOGRAPHY**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1) Understand basics of climatology and oceanography 2) Understand cloud formation and precipitation, monsoon, 3) Understand Classification of climates 4) Understand Wind generated waves in the ocean, 5) Understand Formation of subtropical gyres; western boundary currents; equatorial current systems; El Nino; monsoonal winds and currents over the North Indian Ocean 6). Understand Composition of seawater	
6	Credit Value	Credits - 4	(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	**Climatology:** 1. Composition and Vertical structure of Atmosphere. 2. Heat transfer in the Atmosphere. 3.Heat budget of Earth, albedo, isolation. Seasons on Earth and temperature changes. 4. Humidity, absolute humidity, relative humidity and dew point.	15
II	**Climatology:** 1.Cloud, classification of clouds. 2.Cloud precipitation mechanism – Bergeron, collision coalescence process. 3. Atmospheric stability their types and cloud development. 4.Air Pressure, pressure gradient force and Wind. Small scale and local wind system.	15
III	**Climatology:** 1. Global Atmospheric circulation and Jet Streams. 2. Atmospheric-Ocean water Circulation, Boundary Current, Equitarial current. 3. Atlantic Ocean Circulation, Pacific Ocean Circulation. 4.El- Nina and La-Nina. 5. Indian Ocean Circulation and Indian Monsoon.	15
IV	**Oceanography:** 1. Cyclone and Lightening. 2. Milankovitch Cycle and Hypsographic curve of Earth. 3. Koppen climate classification. 4. Oceanic Tides. 5. Ekman transport, Upwelling, downwelling and Oceanic Waves.	15

Part - C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

-Climatology by D.s lal

-Oceanography by d.s. lal

-Meteorology Today- An Introduction to Weather, Climate and the Environment by Donald C. Ahrens

-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 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**	
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** 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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSE-GESC -27T**	
2	Course Title	**HYDROGEOLOGY**	
3	Course Type	Discipline Specific Course (Theory)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 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	Credits - 3	(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	**Hydrogeology** 1.1 Scope of hydrogeology, Hydrologic cycle. Role of groundwater in the hydrologic cycle. Hydrograph, data collection and analysis. 1.2 Water table and piezometric surface. Water table fluctuation. Water table contour maps, interpretation and uses. 1.3 Water bearing formation types - aquifers, aquitard. aquiclude, aquifuse. Aquifer types: perched, unconfined, semi-confined and unconfined 1.4 Porosity, permeability. Specific yield and specific retention. Storativity and transmissivity.	11
II	**Hydrogeology** 2.1 Ground water movement: Darcy's law and its applications. 2.2 Well and their types. 2.3 Well Development and completion 2.4 Pumping test and yield of wells	11
III	**Hydrogeology** 3.1 Geological and Hydrogeological methods of groundwater exploration. 3.2 Geophysical methods – Electrical resistivity method for groundwater exploration 3.3 Application of remote sensing in groundwater exploration. 3.4. Groundwater provinces of India with special reference to Chhattisgarh region,	11
IV	**Hydrogeology** 4.1 Sources of dissolved constituents in groundwater. Groundwater quality standards-drinking, domestic, agriculture and industry. 4.2 Groundwater pollution. Groundwater management. 4.3 Conservation of Groundwater. 4.4 Artificial recharge.	12

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 Resourses** https://iah.org/

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**	

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** 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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSE-GESC -27P**	
2	Course Title	**Lab Course – I**	
3	Course Type	Discipline Specific Course (practical)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: 1. Understand hydrological and engineering Properties of rocks 2. Interpret Hydrogeochemical analysis	
6	Credit Value	Credit-1	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 50	Min Passing Marks: 17

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.Hydrological properties of rocks 2. Interpretation of water table maps. 3. Computation of pumping test data. 4. Interpretation of Hydrogeochemical data and their plotting in different diagrams. 5. Plotting of groundwater provinces on an outline map of India. 6. Interpretation of engineering properties of rocks in hands specimens. 7. Determination of compressive, tensile and sheer strength of rocks. 8.Determination of porosity and absorption of building materials. 9. Plotting the geographical distribution of important dams, tunnels on the outline of India.	30

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

M.Sc. GEOLOGY NEP PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Masters in Geology		**Semester: IV**	**Session:2025-2026**
1	Course Code	**DSE-GESC -28P**	
2	Course Title	**PROJECT ORIENTED DISSERTATION AND REPORT WRITING (review of literature, methodology, research design, presentation, viva-voce)**	
3	Course Type	Discipline Specific Course (practical)	
4	Pre-requisite (if any)	As per Government norms	
5	Course Learning Outcomes (CLO)	After successfully completing this course, the students will be able to: Identify rocks in the field, understands about mapping a geological terrain., Learn how to write a geological report, learn about how mines operate.	
6	Credit Value	Credit-4	(Credit=30 hours Laboratory or Field learning/ Training)
7	Total Marks	Max. Marks: 150	Min Passing Marks: 60

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,	A practical-focused geological dissertation (21 days) would involve hands-on fieldwork, data collection, analysis, and interpretation related to a specific geological problem or area. It could involve studying geological formations, analyzing rock samples, mapping geological features, or investigating the impact of geological processes on the environment. Example: 1 Identification rocks in the field. 2 Mapping the regional area and create a geological map. 3 Identification of major and minor geological features in the field. 4 Field visit of various mines and geologically significant places 5 Industrial visit. 6 Report writing - review of literature, methodology, research design, 7. Script evaluation and viva – voce on project-oriented dissertation and report writing- Practice about related project work Script evaluation – Content, presentation, analysis and critical thinking, Viva voce – knowledge and understanding, communication, critical thinking and analysis	120

PART -D:Assessment and Evaluation -practical	
Suggested Continuous Evaluation Methods:	
Maximum Marks:	150 Marks
Project orientation dissertation (lab and field)	100 Marks
Internal Assignment, Seminar and Attendance	50 marks

16/7/25