Govt. Nagarjuna P.G. College of Science
Raipur, C.G.

CURRICULUM & SYLLABI

(Based on CBCS & LOCF)

Bachelor of Science (Geology)
(NEP - 2020)
(I & II Sem)
Session : 2025-26

Approved by:	Board of Studies	Academic Council
Date:	07-07-2025	

Department of Geology
Govt. Nagarjuna P.G. College of Science
Raipur, C.G.

Scheme of Papers in B.Sc. I / II Semester Geology 2025-26 as per UGC (NEP 2020)			
Semester	**DSC**	**SEC**	**VAC**
B.Sc. I Sem	Fundamentals of Geology		Disaster Management
B.Sc. II Sem	Essentials of Geology	Rainwater Harvesting	

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FOUR YEAR UNDERGRADUATE PROGRAM

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A: Introduction				
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester: I		Session: 2025-2026
1	Course Code	DSC-GESC-01T		
2	Course Title	Fundamentals of 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 basics of Geology, Solar system and internal structure of the Earth, origin and age of the Earth 2.Understand the theories of continental drift and plate tectonics 3. Understand causes and effects of earthquakes and explain weathering and its products 4.Describe concepts of geomorphology and landforms developed by various geological agencies 5. Explain about the physiographic and tectonic divisions of India		
6	Credit Value	3 Credits	(Credit=15hours-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 (01hour 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

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

Text Books Recommended-

1. भौतिक-भूविज्ञान- डॉ. मुकुल घोष
2. भौतिक-भूविज्ञान- डॉ. जे .पी. तिवारी एव बी.सिंह .के .
3. भूआकृति विज्ञान- डॉ . सविन्द्र सिंह
4. भूविज्ञान एक परिचय .विद्यासागर दुबे .डॉ -
5. भूगतिकी एि भूआकृति विज्ञान- डॉ. दीपकराज तिवारी

6. Holmes,A. DorisLHolmesEdit., Principles of Physical Geology, Van Nostrand Reinhold, 1978.
7. Mahapatra,G.B., Textbook of Physical Geology, CBS, India, 2018
8. Mathur,S.M., Physical Geology of India, NBT India,1991
9. Miller, WilliamJ., Physical Geology: An Introduction. D Van Nostrand Co., 5th Ed., 1949
10. Mukerjee,P.K., Text Book of Geology. World Press Private Ltd, 2013.
11. 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. Nationaldigitallibraryhttps://ndl.iitkgp.ac.in
7. e-PGpathshala (MHRD)portal, https://egpg.inflibnet.ac.in

PART-D: Assessment and Evaluation- Theory		
Suggested Continuous Evaluation Methods: Maximum Marks: 100Marks Continuous Internal Assessment(CIA): 30Marks 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** SectionA:**Q1**.Objective–**10x1=10**Mark; **Q2**.Short answertype-**5x4 =20Marks** SectionB: Descriptive answer type questions, **1 out of 2** from each **unit-4x10=40 Marks**	

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PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester: I	Session: 2025-2026
1	Course Code	DSC-GESC-01P	
2	Course Title	Lab Course – 01 (Fundamentals of Geology)	
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 and describe various landforms in geomorphologic models. 2) 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: 30Periods (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

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Part-C

Learning Resource: Text Books, Reference Books, Others

Text Books Recommended-

1. भौतिक-भूविज्ञान- डॉ. मुकुल घोष
2. भौतिक-भूविज्ञान- डॉ. जेपी .. तिवारी एव बी.सिंह .के .
3. भूआकृति विज्ञान- डॉसविन्द्रसिंह .
4. भूविज्ञान एक परिचय .विद्यासागर दुबे .डॉ -
5. भूगतिकी एि भूआकृति विज्ञान- डॉ. दीपकराज तिवारी

1. Holmes,A.Doris L Holmes Edit.,Principles of Physical Geology, Van Nostrand Reinhold, 1978.
2. Mahapatra,G.B.,Textbook of Physical Geology,CBS,India,2018
3. Mathur, S.M., Physical Geology of India, NBT India,19919.Miller,WilliamJ., 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. Nationaldigitallibraryhttps://ndl.iitkgp.ac.in
7. e-PG pathshala (MHRD)portal, https://egpg.inflibnet.ac.in

PART-D: Assessment and Evaluation- Practical

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA):15Marks
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)–10Marks C. Viva-voce (based on principle/ technology) -05Marks	Managed by Course teacher as Per lab. status

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FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree/ Honors)		Semester: I	Session:2025-26
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)	On completion of Course, the students should be able to- 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

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Part - C
Learning Resource: Text Books, Reference Books, Others
Text Books Recommended- 1. Natural Hazards and Disaster Management: Vulnerability and Mitigation RSS h Rawat Publications 2006 2. Natural Disaster Management Soumitra Roy 2006 Abliijeet 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 and Evaluation -Theory		
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): 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**	

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FOUR YEAR UNDERGRADUATE PROGRAM

DEPARTMENT OF GEOLOGY

COURSE CURRICULUM

PART-A:Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester: II	Session:2025-2026
1	Course Code	DSC-GESC-02T	
2	Course Title	Essentials of 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. Explain about the basics of crystallography, various crystal forms, crystallographic axes and symmetry elements. 2. Describe various forms of normal classes of various crystal systems. Classify the minerals in various silicate groups and explain their varieties. 3. Describe the physical properties of various minerals. 4. Describe the optical characteristics of various minerals.	
6	Credit Value	3 Credits	(Credit=15hours-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	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

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Part-C
Learning Resource: Text Books, Reference Books, Others
1. खनिज तथा क्रिस्टलविज्ञान -डॉ.बी.सी.जैश 2. खनिज विज्ञान के सिद्धान्त डॉ.ए.पी. अग्रवाल 3. प्रकाशीय खनिज विज्ञान केमूल तत्व - विंचेल 4. खनिज तथा क्रिस्टल विज्ञान -डॉ. दीपकराज तिवारी 5. Gribble,C.D. Rutley's Elements of Mineralogy.CBS,2005. 6. FordW.E.;Dana's TextBook of Mineralogy. CBS,2006. 7. Perkins,D.;Mineralogy, Prentice Hall India,3rded.2012. 8. Rathore, B.S.; Basics of Crystallography, Mineralogy and Geochemistry. Notion Press in dia,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-P Gpathshala (MHRD)portal, **https://egpg.inflibnet.ac.in**

PART-D:Assessmentand Evaluation-Theory		
Suggested Continuous Evaluation Methods: Maximum Marks: 100Marks Continuous Internal Assessment (CIA): 30Marks End Semester Exam (ESE): 70 Marks		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test/Quiz-(2):20+20 Assignment/Seminar- 10 TotalMarks-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** SectionA:**Q1**.Objective–**10x1=10**Mark; **Q2**.Short answertype-**5x4 =20Marks** Section B: Descriptive answer type questions, **1outof2** from each unit-**4x10=40 Marks**	

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PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester: II	Session:2025-2026
1	Course Code	DSC-GESC-02P	
2	Course Title	Lab Course – 02 (Essentials of Geology)	
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 the megascopic properties of Quartz and Feldspar group of minerals 2. Understand the megascopic properties of pyroxene group of minerals 3. Understand megascopic properties of Amphibole group of minerals 4. Describe the megascopic properties of olivine and Mica group of Minerals. 5. Describe microscopic identification of minerals. 6. Identify the various crystal Systems and Symmetry through crystal models 7. Assess the miller Indices of the crystal models 8. 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

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

1. खनिज तथा क्रिस्टलविज्ञान -डॉ.बी.सी.जैश
2. खनिज विज्ञान के सिद्धान्त डॉ.ए.पी. अग्रवाल
3. प्रकाशीय खनिज विज्ञान केमूल तत्व - विंचेल
4. खनिज तथा क्रिस्टल विज्ञान -डॉ. दीपकराज तिवारी
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, 3rded. 2012.
8. Rathore, B.S.; Basics of Crystallography, Mineralogy and Geochemistry. Notion Pressin dia,2020
9. Sharma, R.S. and Sharma, Anurag; Crystallography and Mineralogy-Concepts and Methods. Geol. Soc. Ind., Bengaluru, 2013.

e-resources:

10. **https://www.mindat.org**
11. **https://www.mooc-list.com/tags/minerals**
12. **https://epgp.inflibnet.ac.in/Home**
13. **https://archive.org/details/in.ernet.dli.2015.233340/page/n15/mode/2up**
14. **https://egyankosh.ac.in/**
15. **https://sites.google.com/ignou.ac.in/bscgeology**
16. SWAYAM-https://swayam.gov.in/explorer?searchtext
17. National digital library https://ndl.iitkgp.ac.in
18. e-PG pathshala (MHRD)portal, **https://egpg.inflibnet.ac.in**

PART-D: Assessment and Evaluation-Practical		
Suggested Continuous Evaluation Methods: Maximum Marks: 50Marks 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) – 10Marks C. Viva-voce(based on principle/technology) -05Marks	Managed by Course teacher as Per lab. status

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FOUR YEAR UNDERGRADUATE PROGRAM
DEPARTMENT OF GEOLOGY
COURSE CURRICULUM

PART-A: Introduction			
Program: Bachelor in Science (Certificate/Diploma/Degree)		Semester: II	Session:2025-2026
1	Course Code	GESEC-01	
2	Course Title	RAIN WATER HARVESTING	
3	Course Type	Skill Enhancement Course (SEC)	
4.	Pre-requisite(if any)	As per Government norms	
5	Course Learning Outcomes(CLO)	On completion of Course, the students should be able to 1. Define key rain water 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 rain water harvesting plan for a site 5. Refine a conceptual rainwater harvesting plan With relevant systems details	
6	Credit Value	2 Credits	(Credit=30hours-learning&observation)
7	Total Marks	Max. Marks: 50(35+11)	Min Passing Marks: 20

PART-B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 hour per period)-30 Periods (30Hours)

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	11
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	11

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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. Rain water Harvesting for Dry lands and Beyond, Volume 1,3 rd edition" Rain source 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 AG2021 **Online Resources** http://www.rainwaterharvesting.org/

PART-D: Assessment and Evaluation-Theory		
Suggested Continuous Evaluation Methods: Maximum Marks: 50Marks Continuous Internal Assessment (CIA): 15Marks End Semester Exam (ESE): 35Marks		
Continuous Internal Assessment (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**.Shortanswertype - **5x2=10Marks** Section B: Descriptive answer type questions, **3 out of 5** from each **unit-3x5=15 Marks**	

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