Punyashlok Ahilyadevi Holkar Solapur University, Solapur

NAAC Accredited-2022

'B++'Grade(CGPA2.96)

Name of the Faculty: Science &Technology

(As per New Education Policy 2020)

Syllabus: Geology

Name of the Course: B.Sc. I (Sem. I and II)

(Syllabus to be implemented from June 2024)

Punyashlok Ahilyadevi Holkar Solapur University, Solapur,

Faculty of Science & Technology

Choice Based Credit System (CBCS) (w.e.f. June 2024)

~ About National Education Policy (NEP) – 2020 ~

With the directions and guidelines issued by **Government of Maharashtra resolution dated 20th April 2023 and 16th May, 2023** regarding the implementation of NEP at UG and PG level, the Punyashlok Ahilyadevi Holkar Solapur University, Solapur has taken decision to implement NEP 2020 with Choice Based Credit System (CBCS) at Undergraduate level and Post Graduate level. This has been done to achieve the goals and objectives set in NEP-2020 such as- worldwide recognition, acceptability, horizontal as well as vertical mobility for students completing undergraduate and post-graduate degree.

The CBCS provides an opportunity for the students to select from the prescribed courses comprising core, elective/minor or skill based. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations.

Outline of NEP:

The structure of the Three/Four-year bachelor's degree programme allows the opportunity to the students to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per their choices and the feasibility of exploring learning in different institutions. The structure allows students to learn various components like:

(a) Major (Core) Subject (DSC): This comprises of Mandatory and Elective Courses that require students to achieve:

- Minimum 50% of total credits corresponding to Three/Four - year UG Degree- Mandatory Courses are offered in all four years;
- 2 credit courses on Major Specific IKS shall be included under Major;
- Elective courses of Major will be offered in the third and/or final year;
- Vocational Skill Courses, Internship/ Apprenticeship, Field Projects, Research Projects are related to Major

(b) Minor Subject (18-20 Credits)

- The Minor subjects may be from the different disciplines of the same faculty of DSC Major (Core) or they can be from different faculty altogether;
- The credits of Minor subjects shall be completed in the first three years of UG Programme

(c) Generic/ Open Elective Courses (OE) (10-12 credits)

- GE/OE are to be offered in I and/or II year;
- Faculty-wise baskets of OE shall be prepared by Autonomous College.

- OE/GE is to be chosen compulsorily from faculty other than that of the Major or as per the directions issued by NEP-Steering Committee

(d) Vocational and Skill Enhancement Courses (VSEC)

i) Vocational Skill Courses (VSC): (8-10 credits): Includes Hands on Training corresponding to the Major and/or Minor Subjects:

- To be offered in first three years;
- Wherever applicable vocational courses will include skills based on advanced laboratory practical's of Major

ii) Skill Enhancement Courses (SEC): (06 credits)

- To be offered in I and II year;
- To be selected from the basket of Skill Courses approved by Autonomous College

(e) Ability Enhancement Courses (AEC), Indian Knowledge System (IKS) and Value Education Courses (VEC): (14 Credits) **i) AEC:** (08 credits)

- To be offered in I and II year
- English: 04 Credits
- Modern Indian Language: 04 credits
- To be offered from the Basket approved by Autonomous College; The focus for both languages should be on linguistic and communication skills.

ii) IKS: (2 Credits)

- To be offered in I Year
- Courses on IKS to be selected from the basket of IKS courses approved by Autonomous College **iii) VEC:** 04 Credits • To be offered in I year
- Value Education Courses (VEC) such as Understanding India, Environmental Science/Education, and Digital and Technological Solutions.

(f) Field Projects/ Internship/ Apprenticeship/ Community Engagement and Service corresponding to the Major (Core) Subject, Co-curricular Courses (CC) and Research Project • Internship/Apprenticeship corresponding to the Major (Core) Subject: (8 Credits)

- Field Projects/Community Engagement and Service (CEP) corresponding to the Major (Core) Subject (minimum 4-6 credits)

  -To be offered in II and III years of UG Degree Programmes.

- Co-curricular Courses (CC) such as Health and Wellness, Yoga education, sports and fitness, Cultural Activities, NSS/NCC and Fine/ Applied/Visual/ Performing Arts: (8 credits) -To be offered in I and/or II year

- Research Projects: (12 credits)

  -To be offered in the final year for 4-year Honor's with Research UG Degree

- **CREDIT:**

- Credit is a numerical value that indicates students work load (Contact Hours, Lab work, Seminar, Tutorials, Field work etc.) to complete a course unit. The contact hours are transformed into credits. Moreover, the grading system of evaluation is introduced for B.Sc. course wherein process of Continuous Internal Evaluation is ensured.
- **Theory: '**15 contact hours' for theory course constitute 'one credit'
- **Practical/Tutorial: '**30 contact hours' for practical course constitute 'one credit'.
- **Workshop based activities/Skill based activities:** Minimum 30 contact hours per credit in a semester is required
- **Internship/On-Job Training: '**30 contact hours' per credit in a semester is required (1 credit/week)
- **Community Engagement and Service-CEP/Field Project:** 30 contact hours per credit in a semester is required
- **Credit Framework under Three/Four Years UG Programme with Multiple Entry and Multiple Exit Options:**

The minimum and maximum credit structure for different levels under three- or four-year UG programme with multiple entry and multiple exit options are as given below:

Levels	Code	Qualification Titles	Credit Requirements		Semester	Year
			Minimum	Maximum		
4.5	100-199	UG Certificate	40	44	2	1
5.0	200-299	UG Diploma	80	88	4	2
5.5	300-399	Three Year Bachelor's Degree	120	132	6	3
6.0	400-499	Bachelor's Degree Honours OR Bachelor's Degree-Honours with Research	160	176	8	4
	500-599	First Year PG & or PG Diploma	40	44	2	1
6.5	600-699	PG Degree	80	88	4	2
8.0	700-799	Ph.D.	16+ Ph.D. Work		---	---

2. CHOICE BASED CREDIT SYSTEM (CBCS):

Each course carries a defined number of credits. The credits are based on the course structure, including the teaching mode and the number of contact hours for lecture, tutorial, and practical classes. One hour of theory/tutorial teaching per week equals one credit, and two hours of laboratory/demonstration classes per week equals one credit. Credits are considered based on the number of contact hours, course content, teaching methodology, allotted maximum marks.

While calculating the grading, one credit is equal to 25 marks in a semester. Thus, 4 credit courses will receive 100 marks, 2 credit courses will receive 50 marks, and a single credit course will receive 25 marks. The proportion of marks earned in a course and the credits given to that course will be used to calculate the Semester Grade Point Average (SGPA) or Cumulative Grade Point Average (CGPA).

General Education credit refers to a unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching [lecture or tutorial] or two hours of practical work/field work per week. Accordingly, one Credit would mean equivalent to 15 hrs' of theory or **30 hrs' of workshop/ lab/Internship/OJT/FP/CEP/CC work per semester.** For the ease of calculation, the break-up of credits with respect to general education component is as in the table below:

Table 1: Break-Up of Credits and contact hours per credit is as follows

Sr. No.	One Credit	Number of Contact Hours
1	Theory	15 Contact Hours
2	Practical	30 Contact Hours
3	Experiential learning including relevant experience and professional levels acquired	30 Contact Hours

3. DEFINITIONS OF KEYWORDS:

a) **Academic Year**: Two consecutive (one odd + one even) semesters constitute one academic year.

b) **Choice Based Credit System (CBCS):** The CBCS will provides options for students to select courses from the prescribed courses (core, open elective, discipline elective, ability and skill enhancement language, soft skill courses and so on).

c) **Course**: Usually referred to as 'papers' is a component of a programme. All courses need not carry the same weight. The courses will define learning objectives and learning outcomes. A course will be designed to comprise Contact Hours / tutorials / laboratory work / field work / project work / vocational training / viva / seminars / term papers / assignments/ presentations / self-study or a combination of some of these.

d) **Credit-Based Semester System (CBSS)**: Under the CBSS, the requirement for awarding a degree /diploma /certificate is prescribed in terms of the number of credits to be earned.

e) **Credit**: A unit by which the course work is measured. It determines the number of hours of instructions required per week in a semester. One credit is equivalent to one hour of lecture or tutorial or two hours of practical work/field work per week in a semester. It will generally be equal to 15 hours of instructions.

f) **Grade Point**: It is a numerical weight allotted to each letter grade on a 10-point scale.

g) **Credit Point**: It is the product of grade points and the number of credits for a course.

h) **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, D and F.

i) **Programme**: A programme leading to the award of a degree, diploma, or Certificate.

j) **Semester**: Each semester will consist of over 15 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be generally scheduled from June to November and even semester from January to May.

k) **Semester Grade Point Average (SGPA)**: It is a measure of performance of work done in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the full course credits taken during that semester. It shall be expressed up to two decimal places.

l) **Cumulative Grade Point Average (CGPA)**: It measures the overall cumulative performance of a student over all the semesters of a programme. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

m) **Transcript or Grade Card or Certificate:** Based on the grades earned, a graded certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured).

4. Eligibility Criteria:

A candidate should have bachelor's degree in Zoology/Life Sciences/Equivalent subjects (three years course after 10+2) from the recognized university.

5. Examination and Evaluation:

As suggested in NEP 2020, continuous internal evaluation is proposed. Total evaluation proposed is 80:20 ratio for external: internal evaluation. There will be no internal evaluation for lab courses (Excluding project/dissertation).

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

Faculty of Science and Technology

NEP Choice Based Credit System (CBCS) (W.e.f. 2024)

Title of the Course: B.Sc. Part-I Subject: Geology

Preamble:

The purpose of education is to develop an integrated personality of the individual and the educational system. It provides all knowledge and skills to the learner. Earth science is an important scientific discipline which involves dynamics and evolution of earth, interaction with life, oceans and the atmosphere. It also includes Earth's interior and near space environment. The present syllabus constitutes of fundamental part of earth dynamics, minerals, fossils, various structures formed in the rocks. It helps students to have knowledge of the earth, earthquakes and volcanoes, nature and effects of different types of natural stresses acting on and below the earth. A study of field geological terminology and various structures like folds, faults etc. give applied Knowledge to students with respect to engineering geology, economic geology. Minerals are basic substances of the earth. Study of minerals along with crystals help to understand their formation, occurrence and significance. Fossils give information of historical geological events. The syllabus developed for Geology has the provision of ensuring the integrated personality of the students in terms of providing opportunity for exposure to the students towards Discipline Specific Courses, Generic Elective Courses, Value Enhancement Courses and Skill Enhancement Courses with specific skills through practicals and other innovative transactional modes.

Course outcomes:

After completing the course, the student will be able to

- learn the origin of the Solar system and Earth
- understand the Internal structure of Earth
- understand the role of Weathering agents
- learn the fundamentals of Geological mapping.
- learn how to read Contour maps and solve simple Geological maps using Strikes and preparations of cross-sections.
- learn the Concept of Plate tectonics
- learn Earthquakes and Volcanoes
- interpret the Geological maps
- measure the Geological data from the field

- **Eligibility and Admission:** A Candidate passing 10+2 passed from state syllabus / CBSE /equivalent with minimum passing percentage of as per the directives of the higher education and Solapur university, Solapur.
    - **Duration:** The duration for this program is of 3 years with semester pattern (06 Semesters)
    - **Medium of Instruction:** English
    - Syllabus Structure:
    - The University follows semester system. An academic year shall consist of two semesters
    - Each B.Sc. course shall consist of three years i.e. six semesters.
    - B.Sc. Part-I Geology shall consist of two semesters: Semester I and Semester II.

In semester I, there will be two core papers is having paper I and paper II of 100 marks.
Similarly in Semester II there will be two core papers is having paper I and paper II of 100 marks.
The scheme of evaluation of performance of candidates shall be based on University assessment as well as College internal assessment as given below.
For B.Sc. Part-I Geology sem I& II, the internal assessment will be based on Internal tests, Home assignment, Tutorials, Seminars, Group discussion, Brain storming sessions etc. as given below.

Scheme of Evaluation

As per the norms of the grading system of evaluation, out of 100 marks,
the candidate has to appear for college internal assessment of 40 marks and external evaluation (University assessment) of 60 marks.

Semester–I: Theory:(100marks)

University Examination (60 marks): No. of theory papers:2(paper I and paper II of 30 marks each)
Internal Continuous Assessment:(40 marks and 20 marks each for two papers)
(a) Internal test-Home assignment/tutorials/seminars/viva/group discussion/outreach programs.

II Semester: - Theory:(100marks)

University Examination (60marks): No. of theory papers:2(paper III and paper IV of 30 marks each)
Internal Continuous Assessment:(40 marks and 2 marks each for two papers)
(a)Internal test-Home assignment/tutorials/seminars/viva/group discussion/outreach programs.
Internal Continuous Assessment:(20marks):

(a) Internal practical test-Scheme of marking:**10marks**

(b) Viva/group discussion/model or chart/attitude/attendance/overallbehavior:**10marks**

B.Sc. I Semester-I&II, GEOLOGY

Choice Based Credit System (CBCS) Structure (2024)

Semester-I Major (Theory)

Paper	Title	Marks
DSC1-1	**General and Physical Geology**	**50 (30-UA and 20-CA)**

Semester-II Major (Theory)

Paper	Title	Marks
DSC1-2 (2)	**Mineralogy**	**50 (30-UA and 20-CA)**

University, Solapur Faculty of Science and Technology

Three Majors in First Year structure as per NEP-2020 Approved in For AC Meeting on 18/04/2024

4- Year Multidisciplinary UG Program with DSC as a Major (4 -Year Bachelor of Science (Honors)/(Honors with Research))

B.Sc.- I (Geology)

Level/ Difficulty	Sem.	Faculty			Generic / Open Elective GE/ OE	Vocational and Skill Enhancement Courses (SEC/VSC)	Ability Enhancement Course (AEC), IKS, VEC	Field Project/ RP/CC/Internship/Appre	Credits	Cumulative Credits
		Major		Minor						
		DSC	DSE							
4.5 100-200	I	**DSC1-1** **General and Physical Geology (2+2)**			**GE 1/ OE 1 (T)** **Natural Hazards and Disaster Management (2)**	**SEC-1 (P)** **Fundamentals of Geological Mapping (2)**	**L1**-1(2) **IKS** General IKS (2) **VEC-1** Constitution of India (2)		22	**44** **UG Certificate (44)**
		DSC2-1 (2+2)								
		DSC3-1 (2+2)								
	II	**DSC1-2** **Mineralogy (2+2)**			**GE2/ OE2 (T)** **Environmental Geology (2)**	**SEC 2 (P)** **Drainage Morphometry (2)**	L1-2(2) **VEC - 2** (Environmental Studies) (2)	CC1 (2)	22	
		DSC2-2 (2+2)								
		DSC3-2 (2+2)								
Exit option: Award of UG Certificate with 44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor										

Structure as per NEP-2020
B. Sc. I (Geology)

Level	Sem.	Major		Minor	VSC/ SEC	OE/GE	IKS	CC	Total Credits	Cumulative Credits
		T	P	T						
C	I	2	2		SEC 1-2 (P)	OE – 1 -2	IKS (2) L1-1 (2) VEC 1 (2)	-	22	
4.5	II	2	1		SEC -2 – 2 (P)	OE – 2 -2	L1- (2) VEC (2)	CC -1 (2)	22	44
		2	1							

SEM -I				
S.No.	**Course Type**	**Course Code**	**Paper Title**	**Credit**
1.	**Major (T)**	**DSC 1-1 Go4-0109**	**Geology-I – (Theory)** **General and Physical Geology**	2
2.	**Practical based on DSC1-1**	**Practical -I Go4-0109P**	**Practical -I** **General and Physical Geology**	2
3.	Major	DSC 2-1	To be selected from Other than Geology	2
4.	Major	DSC 3-1	To be selected from Other than Geology	2
5	**GE – 1 (T)**	**Theory GE -1** **GO4-GE-OE-0109**	**Natural Hazards and Disaster Management (Theory)**	2
6	**SEC (P)**	**Practical SEC -I** **Go4-SEC-0109**	**Practical – SEC - I** **Fundamentals of Geological Mapping**	2
7.	IKS	IKS **Go4-IKS-0109**	General IKS	2
8.	AEC	L1-1 **Go4-ENG-0109**	English	2
9.	VEC	VEC 1 **Go4-ICD-0109**	India Constitution and Democracy	2
10.				
			Total	**22**
SEM II				
10.	**Major (T)**	**DSC 2-1 Go4-0209**	**Geology-II (Theory)** **Mineralogy**	2
11.	**Practical based on DSC 2-1**	**Practical - II Go4-0209P**	**Practical - II** **Mineralogy**	2
12.	Major	DSC 2-2	To be selected from Other than Geology	2
13.	Major	DSC 2-3	To be selected from Other than Geology	2
14.	**GE-2 (T)**	**OE-2/GE-2 (Theory)** **Go4-GE-OE-0209**	**OE – 2 (Theory)** **Environmental Geology**	2
15.	**SEC (P)**	**Practical SEC -2** **Go4-SEC-0209**	**Practical SEC- 2** **Drainage Morphometry**	2
16.	AEC	L1-2 **Go4-ENG-0209**	English	2
17.	VEC	VEC 2 **Go4-ENS-24**	Environmental Studies	2
18.	CC1	CC1	NCC/NSS/Culture/sports/Health ,Wellness and Fitness/Yoga	2
			Total	**22**

Abbreviations:

PAH SOLAPUR UNIVERSITY,
SOLAPUR
(As per NEP 2020) - Geology

Semester – I

Course Code	Title of Papers	Distribution of Marks for Examination			Total credit
		CA	UA	Total	
DSC1-1 (2)	**General and Physical Geology**	20	30	50	2
PR DSC1-1 (2)	Practical based on DSC1	20	30	50	2
GE – 1 (2)	**Natural Hazards and Disaster Management**	20	30	50	2
PR SEC 1(2)	**Fundamentals of Geological Mapping**	20	30	50	2
	Marks + Credit for Semester – I	**80**	**120**	**200**	08

IKS: Indian Knowledge System

Semester –II

DSC1-2 (2)	**Mineralogy**	20	30	50	2
PR DSC1-2 (2)	Practical based on DSC1-2	20	30	50	2
GE-1 (2)	**Environmental Geology**	20	30	50	2
PR SEC 2 (2)	**Drainage Morphometry**	20	30	50	2
	Marks + Credit for Semester – II	**80**	**120**	**200**	**08**
	Total Marks + Credit for Semester - I	110	440	550	**22**
	Total Marks + Credit for Semester - II	110	440	550	**22**
	Total Marks and Credit	**220**	**880**	**1100**	**44**

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SEM -I

DSC 1- 1 (Theory)

Title of the Paper - General and Physical Geology

Credits: 02 **Total Marks: 50** **Theory: 30 Periods**

About the Course:
The main objective of the course is to introduce the basic understanding of the solar system, its components and origin. It is also intended to give an overall understanding of the earth system including its components, dynamics and history, work of different geological agents.

Course Learning Outcome
The study of this paper strengthens knowledge of students of any discipline with respect to understanding the essentials of the structural dynamics of the earth. They will also understand the origin of solar system, geological features of river, ocean, wind as well as processes of weathering.

Unit No.	Title of topic and contents	Contact Hours	Weightage marks
I	**General Geology:** Earth as a planet: Holistic understanding of dynamic planet 'Earth' through Geology. Introduction to various branches of Geology with significance. General characteristics and Origin of the Universe, Solar System, and its planets. The terrestrial and Jovian planets. Physical data of earth - size, shape, mass, density, rotational and revolution parameters, and age of earth.	15	15
II	**Physical Geology:** Earth Processes – Exogenous and Endogenous Earthquakes- Definition, Terminology, Causes, effects, Seismic waves, Scale, seismograph Volcano – Definition, Typical structure, Products, Types – based on eruption, Interior of the earth – Crust, Mantle and Core Weathering – Definition and Types Study of erosional, transportational and depositional work by River, Wind, Ocean	15	15

DSC 1 - 1 (Practical)

Title - General and Physical Geology

Credits: 02 **Total Marks: 50** **Practical: 60 Periods**

Unit No.	Title of topic and contents	Contact Hours
I	Study of Topographic sheets – Contours, Natural and Man-made features Draw labelled diagrams Outer and Inner planets Study of different Geomorphic models of River, Ocean, Wind Draw diagram of Soil Profile Describe different types of Soils of India Study of seismic zone map of India Visit to Geological site	04/week

Text Books:

1. **A Text Book of Geology** - P.K. Mukherjee, *World Press, Kolkata*
2. **Physical Geology**- Charles C. Plummer, Diane H. Carlson and Lisa Hammersley, *McGraw Hill*
3. **Principles of Physical Geology** - Arthor Holmes, *Champman and Hall, London*
4. **A text book of Physical geology-** Mahapatra, G.B., 1994. CBS Publishers

Reference Books:

1. **Earth Science: The Earth, The Atmosphere, and Space** - S. Marshak and R. Rauber, *W.W. Norton & Co.*
2. **Encyclopaedia of Geomorphology** - Andrew S. Goudie, *Routledge*
3. **Introduction to Coastal Processes and Geomorphology** - Robin Davidson-Arnott, *Cambridge*
4. **Introduction to Physical Geology**- Thompson and Turk, *Brooks*

GE-I/OE-I) (Theory)

Title of the paper: Natural Hazards and Disaster Management

Credit: 02 **Total Marks: 50** **Theory: 30 Periods**

About the course:
To create awareness and knowledge base of different types of natural disasters.
To understand the management of natural disasters. To impart knowledge regarding the risks, vulnerability and disaster risk reduction.

Course Learning Outcomes
Students understand disaster, types of natural disasters. They also understand role of geology for natural disasters, landslide causes & mapping techniques, Disaster management techniques in day today life.

Unit No.	Title of topic and content	Contact Hours	Weightage marks
I	**Natural Disaster**: Definitions of Hazard, Disaster and Natural disasters: study of different natural hazards viz. Floods, Volcano, cloud burst, drought, Earthquakes, Volcano and Landslides, cyclones.	**15**	**15**
II	**Management of Disaster:** Meaning, nature, importance and scope of disaster management. Disaster Management Cycle, Stages of disaster management. Disaster risk reduction, prevention, mitigation and preparedness to Natural hazards	**15**	**15**

Text Books:

1. Bell, F.G. Routledge, Geological Hazards, London.
2. Smith, K. Environmental Hazards. Routledge, London.
3. Subramaniam, V. Textbook in Environmental Science Narosa International
4. Mukesh Dhunna Disaster Management, , Vayu Education of India.
5. Rajendra K. Bhandari, 2014., Disaster Education and Management, Springer India

SEC -1 Skill Enhancement Course - I (Practical)

Title of the paper - Fundamentals of Geological Mapping

Credit: 02 **Total Marks: 50** **Practical: 60 Periods**

About the Course:
The main aim of the course is to Provide basic knowledge of topographic sheets, geological field materials and their use. It also includes to upgrade and relate the theoretical knowledge of Geological aspects to field observations. This course also introduces the basic principles and techniques of GPS and GIS.

Course Outcomes:
This knowledge help students to learn and plan for a geology field trip. It also help to keep record of detailed field observations systematically in their field diary and subsequently prepare a geologic field report of the same.

Title of topic and contents	Contact Hours
1. Study of SOI Toposheet - Symbol reading (Natural, Man-made) (Set - I) 2. Study of SOI Toposheet - Symbol reading (Natural, Man-made) (Set - II) 3. Study of Contours, types of contours, contour maps 4. Study of Standard Symbols/colour for lithology and symbols related to geological structures 5. Study of Preliminary/ Basics of preparation of field visits 6. Study of Outcrops, their types, Strike and Dip 7. Introduction to Clinometer, Brunton compass 8. Study of Preparation of Geological maps 9. Preliminary Study of Satellite Imageries 10. Introduction to GPS and GIS 11. Field visit and preparation of report	04/ week

Textbooks:

1. **Gokhale, N W., (2001)** A Guide to Field Geology, CBS Publishers & Distributors
2. **Lahee, F H. (1962)** Field Geology, McGraw – Hill Book Company, Inc
3. **Compton, R R.,** (1985) Geology in the Field, John Wiley & Sons, Inc.
4. **Compton, R R.,** (1962) Manual of Field Geology, John Wiley & Sons, Inc

Reference Books:

1. **Arora, K R., (2015)** Surveying Vol-2 (13th edition). Standard Book House Unit of Rajsons Publication Pvt. Ltd.
2. **DST-IGET**, QGIS Tutorials http://dst-iget.in/index.php/tutorialdetails/1/1

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SEM -II

DSC 1- 2 Geology (Theory)

Title of the Paper – Mineralogy

Credits: 02 **Total Marks: 50** **Theory: 30 Periods**

About Course:
The course includes the study of minerals with physical properties with their formation. Further, it also deals with the study of different minerals and groups.

Course Outcome:
The students will learn the basics of mineralogy. The students will be able to identify common rock forming minerals in hand specimens with their occurrence.

Unit No.	Title of topic and contents	Contact Hours	Weightage marks
I	Mineral – Definition Study of Physical properties of different minerals viz. – Colour, streak, Lustre, Fracture, Hardness, Cleavages, Forms and their different types	5	6
II	Study of following rock forming minerals with their physical properties, chemical composition, occurrence Quartz - Quartz crystal, Rock crystal, Amethyst, Milky quartz, Agate, Opal Felspar - Orthoclase, Plagioclase, Microcline Olivine Pyroxene - Augite, Hypersthene Amphibole - Hornblende, Asbestos, Tremolite, Actinolite Zeolites - Stilbite, Apophyllite, Natrolite Mica - Muscovite, Biotite, Lepidolite Other - Gypsum, Garnet, Calcite, Kyanite, Beryl, Corundum,	10	9
III	**Petrological Microscope and Optical Mineralogy:** Nature of Ordinary and polarized Light Polarizing Microscope – Different parts and functioning. Optical properties of minerals in Plane Polarized Light - Color, Pleochroism, Form, Relief and Cleavage and between crossed nicols - Isotropism / anisotropism, twinning, Extinction, Extinction angle, Interference Colors. Optical properties of common rock forming minerals - Quartz, Orthoclase, Plagioclase, Microcline, Olivine, Augite, Hypersthene, Hornblende, Muscovite, Biotite, Garnet, Calcite.	15	15

DSC 1 - 2 (Practical)

Title of the Paper – Mineralogy

Credits: 02 **Total Marks: 50** **Practical: 60 Periods**

Unit No.	Title of topic and contents	Contact Hours
I	Study of following rock forming minerals with their physical properties, chemical composition, Geological occurrence, uses Quartz - Quartz crystal, Rock crystal, Amethyst, Milky quartz, Agate, Opal Felspar - Orthoclase, Plagioclase, Microcline Olivine Pyroxene - Augite, Hypersthene Amphibole - Hornblende, Asbestos, Tremolite, Actinolite Zeolites - Stilbite, Apophyllite, Natrolite Mica - Muscovite, Biotite, Lepidolite Other - Gypsum, Garnet, Calcite, Kyanite, Beryl, Corundum	04/week
II	**Optical Mineralogy:** Study of Parts of Petrological Microscope Optical properties of common rock forming minerals - Quartz, Orthoclase, Plagioclase, Microcline, Olivine, Augite, Hypersthene, Hornblende, Muscovite, Biotite, Garnet, Calcite.	

Text Books:

1. **An Introduction to the Rock-Forming Minerals** - W.A. Deer, R.A. Howie and J. Zussman, *The Mineralogical Society London*
2. **Rutley's Element of Mineralogy (Rev. Ed.)** Read, H.H., 1968. Thomas Murby and Co.

Reference Books:

1. Atlas of Rock-Forming Minerals in Thin Section - W. S. MacKenzie and C. Guilford, *Routledge*
2. Dana's Textbook of Mineralogy - William E. Ford, *CBS Publishers and Distribut*

(OE-2/GE-I) (Theory)

Title of the paper: Environmental Geology

Credit: 02 **Total Marks: 50** **Theory: 30 Periods**

Course Objective

The course includes understanding of basics of environment, various environmental domains, environmental pollution and practices, natural hazards and disasters.

Course Learning Outcome

Upon completion of the course, students will become aware of the importance of environment. They also will know the fundamentals of earth science as applied to the interaction between human activity and the natural environment in terms of pollution, earth processes.

Title	Contact Hours
Definition of Environment and Dimensions of Environment. General idea about components and composition of different Environmental domains such as Atmospheres, Hydrosphere, Biosphere Types of pollution (water, air, soil) Past Climates in the earth history Concept and origin of monsoon Types of natural hazards Soil – Formation, profile and types	**30**

Text Books:

1. Text Book of Environmental Studies. Asthana, D. K. 2006. S. Chand Publishing.

2. **Fundamentals of Environmental Studies,** Basu, M., Xavier, S. 2016. Cambridge University Press, India.

3. **Environmental Geology** - James S. Reichard, *McGraw Hill*

4. **Environmental Geology –** Valdiya K S 2nd Edi**.** *McGraw Hill*

Reference Books:

1. **Environmental Geology** - C. Montgomery, *John Wiley and Sons*

SEC - II (Practical)

Title of the paper – Drainage Morphometry

Credit: 02 **Total Marks: 50** **Practical: 60 Periods**

Unit No.	Title of topic and contents	Contact Hours
I	1. Study of drainage pattern with geological significance (Dendritic, Parallel, Rectangular, annular, trellis, centripetal, radial) 2. Demarcation of Drainage basins from topographic sheets 3. Estimation of Morphometric Parameters of drainage basins. a. Stream length and number of streams b. Stream length ratio c. Bifurcation ratio d. Drainage area e. Elongation ration **f.** Drainage Density	04/week

Text Books:

Groundwater hydrology, 2ed. Todd, D. K. John Wiley. (p. 535).
Groundwater: Assessment, Development and management, Karanth K.R. Tata McGraw-Hill Pub. Co. Ltd.

Additional Reading:
Introduction to Hydrology. Syed Tajdarul Hassan. 2017. E-PG Pathshala, UGC, MHRD, Govt. of India. Available on: https://epgp.inflibnet.ac.in/ahl.php?csrno=448

Course Objective

The intention of the course is to introduce the fundamental concepts, principles and planning of watershed development and provides inputs for integrated watershed management.

Course Learning Outcome

After completion of this course, the students will acquire knowledge about watershed and related morphometric characters

UA

Punyashlok Ahilyadevi Holkar Solapur University, Solapur.

Faculty of Science & Technology.

Nature of Question Paper for CBCS Pattern NEP

B. Sc. (Part- I) w.e.f. AY 2024-25

Time: 1.5 Hours Total Marks: 30

Instructions

1) All Questions are compulsory

2) Figure to right indicate full marks.

Q.1 Choose correct alternative. (MCQ) 06 Marks

1)

a) b) c) d)

2)

a) b) c) d)

3)

a) b) c) d)

4)

a) b) c) d)

5)

a) b) c) d)

6)

a) b) c) d)

Q.2. Answer the following. (Any three) 6 (2+2+2)

A)

B)

C)

D)

E)

Q.3. Answer the following (Any two). 6 (3+3)

A)

B)

C)

Q.4. Answer the following (Any two). 6 (3+3)

A)

B)

C)

Q.5. Answer the following (Any one). 6 Marks

A)

B)

CA

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Nature of Question Paper for CBCS Pattern

B. Sc. / B.C.A. (Part- I) w.e.f. AY 2024-25

Time: Total Marks: 20

- **Internal Evaluation System for 20 Marks**
  - Choose any two of the following
  - Home Assignment / Unit Test / Tutorial /Seminar

- **Pattern of Examination:**
  - External Evaluation + Internal Evaluation
  - 30 Marks + 20 Marks = 50 Marks
- **Passing Criteria:**
  - Written Exam – 12 out of 30
  - Continuous Assessment (CA) – 08 out of 20
