Estd. 1962
"A++" Accredited by NAAC(2021)
With CGPA 3.52

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दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दुरध्वनी विभाग २३१–२६०९०९३/९४

SU/BOS/Science/ 42 **Date: 17/ 10/ 2022**

To,
The Principal,
All Affiliated Concerned Science Colleges/Institutions
Shivaji University, Kolhapur.

Subject :- Regarding syllabi of M. Sc. & B.Sc. Part- I (NEP-2020) degree programme under the Faculty of Science and Technology as per National Education Policy 2020 .

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi and Nature of question paper of **M. Sc. & B.Sc. Part- I Information Technology** under the Faculty of Science and Technology **as per National Education Policy 2020 .**

Sr. No.	Faculty of Science and Technology	Programme/ Course
1	**Geography & Geology**	M. A./M.Sc Part-I Geography,
		M.Sc. Part -I Geology,
		B.Sc. Part-I Geology,
		B.Sc Part-I Geography,

This syllabi and nature of question paper shall be implemented from the Academic Year **2022-2023** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (students Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy Registrar

Copy to:

1	The Dean, Faculty of Science & Technology	7	Appointment Section
2	Director, Board of Examinations and Evaluation	8	P.G.Seminar Section
3	The Chairman, Respective Board of Studies	9	Computer Centre (I.T.)
4	B.Sc. Exam	10	Affiliation Section (U.G.)
5	Eligibility Section	11	Affiliation Section (P.G.)
6	O.E. I Section	12	P.G.Admission Section

SHIVAJI UNIVERSITY, KOLHAPUR

NATIONAL EDUCATION POLICY (NEP-2020)

SYLLABUS WITH EFFECT FROM AUGUST 2022

B. Sc. Part – I

SUBJECT: GEOLOGY

Semester – I (Duration: 06 Months - 24 Weeks)

DSC – A Theory Course

Teaching: 60 hrs. (75 lectures of 48 minutes)

Title of the Paper: PHYSICAL AND STRUCTURAL GEOLOGY

DSC 21A: PHYSICAL GEOLOGY Marks-50 (Credits: 02)

Unit I: (15 Hours) (18-19 Lectures)

Introduction to Geology and its scope, Earth and Solar system: origin, size, shape, mass, density and its atmosphere (3 Hours approx.)

Origin of Earth: Laplace and Kant Nebular Hypothesis; Buffon, Chamberlain and Moulton Planetesimal Theory, Jean and Jeffery's Tidal Theory (3 Hours approx.)

Age of Earth: Physical, Chemical, Biological and Radioactive methods (4 Hours approx.)

Interior of the Earth: Use of seismic waves in understanding the internal structure of the Earth- Inner Core, Transition zone, Outer Core, Mantle, Asthenosphere, Mesosphere, Lithosphere- Sial and Sima(Crust) and main Discontinuities (5 Hours approx.)

Unit II: 15 Hours (18-19 Lectures)

Weathering: Definition, Types, Agents and controlling factors (3 Hours approx.)

Earthquake: Seismology- Definition, Focus, Epicenter, Seismic waves, Isoseismal lines Measurement of earthquakes –Seismographs and Seismograms, Intensity and Magnitude, Earthquake scales: Mercalli Scale and Richter Scale

Causes of Earthquake – Natural and Manmade (7 Hours approx.)

Volcano: Types, Products and Causes of Volcanism (5 Hours approx.)

DSC 22A: STRUCTURAL GEOLOGY Marks-50 (Credits: 02)

Unit I: (15 Hours) (18-19 Lectures)

Introduction to Structural Geology, Elementary idea of Bed, Dip and Strike, contours, Outcrops, effects of various structures on outcrop; (4 Hours approx.)

Topographic and Geological maps; (4 Hours approx.)

Clinometer, Brunton Compass and their use; (2 Hours approx.)

Folds: Parts of Folds,Types of Folds (5 Hours approx.)

Unit II: (15 Hours) (18-19 Lectures)
Faults: Parts of Fault; Geometric and Genetic Classification of Faults (5 Hours approx.)
Joints: Definition; Types of Joints; Significance of Joints (5 Hours approx.)
Unconformity: Definition, Types of Unconformities; Significance of Unconformities (5 Hours approx.)

DSC – A LAB COURSE:

Teaching: 15 Practical turns - each of 3.2 hours (4 Lectures of 48 Minutes)

Marks - 50 (**Credits: 02)**

PHYSICAL AND STRUCTURAL GEOLOGY

Marks - 50 (Credits: 02)

Section I

Physical Geology: (15 Practical classes of 2 hours duration totaling to 30 hours or equivalent)

1. Study of important and common geomorphological models
2. Reading of Toposheets
3. Identification of geomorphological features – natural and manmade

Section II

Structural Geology: (15 Practical classes of 2 hours duration totaling to 30 hours or equivalent)

1. Study of Clinometer / Brunton Compass
2. Identification of folds from block models
3. Identification of faults from block models
4. Preparation of cross-section profile from geological maps – Horizontal/Inclined beds.

Recommended Books

1. Arthur Holmes, 1992. Principles of Physical Geology. Chapman and Hall, London.
2. Miller, 1949. An Introduction to Physical Geology. East West Press Ltd.
3. Spencer, E.V., 1962. Basic concepts of Physical Geology. Oxford & IBH.
4. Mahapatra, G.B., 1994. A text book of Physical geology. CBS Publishers.
5. Billings, M.P., 1972. Structural Geology. Prentice Hall.
6. Davis, G.R., 1984. Structural Geology of Rocks and Region. John Wiley
7. Hills, E.S., 1963. Elements of Structural Geology. Farrold and Sons, London.
8. Singh, R. P., 1995. Structural Geology, A Practical Approach. Ganga Kaveri Publ., Varanasi

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B. Sc. Part – I

SUBJECT: GEOLOGY

Semester – II (Duration: 06 Months - 24 Weeks)

DSC – B Theory Course

Teaching: 60 hrs. (75 lectures of 48 minutes)

Title of the Paper: MINERALOGY AND CRYSTALLOGRAPHY

DSC 21B: MINERALOGY Marks-50 (Credits: 02)

Unit I: (15 Hours)

Definition of Mineral, Chemical Bonding in minerals - (2 Hours)

Description Physical Properties of minerals - Form, Colour, Transparency, Streak, Lustre, Cleavage, Fracture, Hardness and Specific Gravity - (3 Hours)

Study of following mineral Groups (Chemical composition, Crystal system, and Physical properties): Silica Group, Feldspar Group, Pyroxene Group, Amphibole Group, Mica Group, Garnet Group, Olivine Group, Zeolites, Aluminosilicates, Carbonates -(10 Hours)

Unit II: (15 Hours)

Ordinary and Polarized Light, Polarizing Microscope – Parts and functioning – (3 Hours)

Optical properties of minerals in Plane Polarized Light (IPL) –Colour, Pleochroism, Form, Relief, Cleavage, Fracture etc – (3 Hours)

Optical properties between crossed nicols (BCN) –Isotropism / Anisotropism, Extinction, Extinction angle, Interference Colours / Polarization colours – (3 Hours)

Study of optical properties of common rock forming mineral –Silica Group, Feldspar Group, Pyroxene Group, Amphibole Group, Mica Group, Garnet Group, Olivine Group, Zeolites, Aluminosilicates, Carbonates – (6 Hours)

DSC 22B: CRYSTALLOGRAPHY Marks-50 (Credits: 02)

Unit I: (15 Hours)

Definition of crystal, Crystal Elements: Faces, Edges, Solid angles, Forms (open and closed), Zones - (3 Hours)

Interfacial angle: Law of constancy of Interfacial angle, Contact Goniometer - (2 Hours)

Crystallographic axes and angles - (2 Hours)

Parameters and Indices, Law of Rational Indices - (3 Hours)

Classification of crystal systems 6/7 systems and 32 classes – (2 Hours)

Elements of Symmetry - (3 Hours)

Unit II: (15 Hours)
Description of Normal class of – Isometric, Tetragonal, Hexagonal, Orthorhombic, Monoclinic and Triclinic system (12 Hours)
Characteristics of minerals belonging to each crystal system. (3 Hours)

DSC – B LAB COURSE

Teaching: 15 Practical turns - each of 3.2 hours (4 Lectures of 48 Minutes)

Marks - 50 (**Credits: 02)**

MINERALOGY AND CRYSTALLOGRAPHY

Marks - 50 (Credits: 02)

Section I

- **Mineralogy:** (15 Practical classes of 2 hours duration totaling to 30 hours or equivalent)
  1. Study of physical properties of minerals - Silica Group, Feldspar Group, Pyroxene Group, Amphibole Group, Mica Group, Garnet Group, Olivine Group, Zeolites, Aluminosilicates, Carbonates

  2. Study and use of Polarizing Microscope

3. Study of Optical properties of common rock forming minerals – Silica Group,

Feldspar Group, Pyroxene Group, Amphibole Group, Mica Group, Garnet Group,

Olivine Group, Zeolites, Aluminosilicates, Carbonates

Section II

- **Crystallography:** (15 Practical classes of 2 hours duration totaling to 30 hours or equivalent)
  Study of Normal class of Isometric, Tetragonal, Hexagonal, Orthorhombic, Monoclinic and Triclinic systems covering crystallographic axes, elements of symmetry, type mineral, holding position and forms with faces and indices.

Geological Field Training

Geological Field Training is compulsory for students.
Department should arrange one-day field tours in areas of Geological interest.
Students should submit Geological study tour report compulsorily during the Practical examination.

Recommended Books

1. Dana, E.S. and Ford, W.E., 2002. A textbook of Mineralogy (Reprints).
2. Flint, Y., 1975. Essential of crystallography, Mir Publishers.
3. Phillips, F.C., 1963. An introduction to crystallography. Wiley, New York.
4. Berry, L.G., Mason, B. and Dietrich, R.V., 1982. Mineralogy. CBS Publ.
5. Nesse, D.W., 1986. Optical Mineralogy. McGraw Hill.
6. Read, H.H., 1968. Rutley's Element of Mineralogy (Rev. Ed.). Thomas Murby and Co.
7. Berry and Mason, 1961. Mineralogy. W.H. Freeman & Co.
8. Kerr, B.F., 1995. Optical Mineralogy 5th Ed. Mc Graw Hill, New York.

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- **Scheme of Practical Examination for B. Sc. Part –I**

1. Practical examination will be conducted annually.
2. Practical examination will be conducted for one day per batch.
3. The examination will be conducted in two sessions per day and each session will be of three hours duration.
4. At least eighty percent practical should be completed by the student.
5. Marks: 50. Minimum for passing: 35%.

Nature of Question Paper

Theory: Time -2 hours, Marks-50 Credits-2
Question 1: Select the correct alternative (Compulsory 10 questions) 10 marks
(Four alternatives for each question)
Question 2: (Attempt any Two out of three) 20 marks
(Long answer type)
Question 3: (Attempt any four out of six) 20 marks
(Short answer type)

Note: Equal weightage should be given to each unit.

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