SEMESTER-IV

SEMESTER IV:
Paper: MJ GEO - 401: Geomorphology
(Course code: MJ GEO - 401) Credit: 3

GEOLOGY SPECIFIC CORE COURSE							
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*THEORY*			
				Credits	*Lectures*	*External*	*Internal*
Diploma Course	**B.Sc.-IV**	*MJ GEO-401*	*Geomorphology*	**3**	**45**	*40 Marks*	*35 Marks*
UNIT	*TOPIC*						*No. of Lectures* **(45 hrs)**
Unit 1	**Introduction to Geomorphology** • Introduction to Geomorphology and Geomorphic process; endogenic, exogenic. • Introduction to weathering: physical, chemical and biological. • Concepts of geomorphology • Introduction to Eustasy and Sea Level change.						**15**
Unit 2	**Fluvial and Aeolian systems.** • Fluvial Processes; Introduction to River Basin and Drainage network. • Genetic classification of stream, Types of drainage patterns. • Erosional and depositional landforms of fluvial system. • Aeolian Processes and Landforms.						**15**
Unit 3	**Glacial, coastal systems and Karst topography** • Glacial Processes, erosional and depositional landforms • Coastal Processes, erosional and depositional landforms • Karst topography – essential conditions to development of karst, features characteristics of karst region. important karst regions.						**15**

Suggested readings:

- Bloom A. L. Geomorphology: A Systematic analysis of late Cenozoic landforms. (3rd Ed.)
- Thornbury, W.D. Principles of geomorphology. CBS Pub. Delhi
- Mukherjee, P. K. (1997) A text book of Geology, The World Press Pvt. Ltd., Calcutta.

Note: Students may refer variety of material available online and on web resources for further understanding.

SEMESTER IV:
Geomorphology
(Course code: MJ GEO – 402-P) Credit: 1

Practical/ Lab course

Course Outcome

After the completion of the course the students will be able to:

1. Basic understanding of drainage patterns.
2. Students will learn morphometric analysis of the basin.
3. Develop skills for landform identification from satellite imageries.
4. Understand geomorphic processes in field.

DISCIPLINE SPECIFIC CORE COURSE						
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*PRACTICAL*		
				Credits	*Lectures*	*INTERNAL/ External*
Diploma Course	**B.Sc IV**	**MJ GEO – 402-P**	**Geomorphology**	**1**	**30 hrs**	*25 (15+10) Marks*

- Drainage mapping and drainage pattern identification from satellite imageries.
- Drainage Morphometric analysis.
- Extraction of landforms of Fluvial system
- Extraction of landforms of Coastal system.
- Extraction of landforms of Aeolian system.
- Extraction of landforms of Glacial origin.
- Geomorphic features identification in field.

Note: Additional practical related to syllabus may be included during class work.

Journal / Field Report/ Submission

Note: It is compulsory to record laboratory work (all the practicals) in the journal. The journal is to be certified by the incharge teacher and the Head of the Department within time frame. Certified journal must be produced while appearing at the time of Practical examination.

SEMESTER IV:
Paper: MJ GEO - 403
Structural Geology
(Course code: MJ GEO - 403) Credit: 3

GEOLOGY SPECIFIC CORE COURSE							
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*THEORY*			
				Credits	*Lectures*	*External*	*Internal*
Diploma Course	B.Sc.-IV	*MJ GEO-403*	*Structural Geology*	3	45	*40 Marks*	*35 Marks*
UNIT	*TOPIC*						*No. of Lectures* (45 hrs)
Unit 1	**Introduction to Structural Geology** • Introduction, Concepts of structural geology; Layering Outcrop, Dip and Strike, Importance of Strike and Dip. • Deformation; introduction, types of deformation. • Introduction to linear and planer structures. • Importance of Structural Geology.						**15**
Unit 2	**Elementary study of Fold and Joints** • Introduction to Stress and Strain. • Elementary study of folds, terminology, fold types and classifications. • Criteria for recognition of folds in field. • Joints; introduction, types, classification, and significance.						**15**
Unit 3	**Elementary study of Fault and Unconformity** • Fault; definition, terminology, types and classification. • Criteria for detecting Faults in field. • Unconformity; definition and types. • Inliers and outliers.						**15**

Suggested readings:

- Billings, M. P. (1987) Structural Geology, 4th edition, Prentice-Hall.
- S K Ghosh (1993), Structural geology: fundamentals and modern developments
- Davis, G. R. (1984) Structural Geology of Rocks and Region. John Wiley
- Lahee F. H. (1962) Field Geology. McGraw Hill

Note: Students may refer variety of material available online and on web resources for further understanding.

SEMESTER IV:
Structural Geology
(Course code: MJ GEO – 404-P) Credit: 1

Practical/ Lab course

Course Outcome

After the completion of the course the students will be able to:

1. Basic understanding of counter.
2. Students will learn concept of dip and strike.
3. Develop skills for drawing structural profile from the given data/map.
4. Visualisation of the litho units and its structural arrangement.

DISCIPLINE SPECIFIC CORE COURSE						
COURSE	***SEMESTER***	***COURSE CODE***	***COURSE TITLE***	***PRACTICAL***		
				Credits	***Lectures***	***INTERNAL/ External***
Diploma Course	**B.Sc IV**	**MJ GEO – 404-P**	**Structural Geology**	**1**	**30 hrs**	***25 (15+10) Marks***

- Sections and Descriptions of Geological Maps with Horizontal and Inclined, continuous One series strata with Inliers, Outliers and Igneous Intrusions.
- Drawing of contours depicting typical landforms.
- Outcrop filling problems of Horizontal and Inclined strata.
- Geometrical solutions of simple structural problems– width of Outcrop, True Thickness and Vertical Thickness.

Note: Additional practical related to syllabus may be included during class work.

Journal / Field Report/ Submission

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SEMESTER IV:

Paper: MJ GEO - 405
Mineralogy
(Course code: MJ GEO - 405) Credit: 3

GEOLOGY SPECIFIC CORE COURSE							
COURSE	***SEMESTER***	***COURSE CODE***	***COURSE TITLE***	***THEORY***			
				Credits	***Lectures***	***External***	***Internal***
Diploma Course	**B.Sc.-IV**	***MJ GEO-405***	***Mineralogy***	**3**	**45**	***40 Marks***	***35 Marks***

UNIT	***TOPIC***	***No. of Lectures (45 hrs)***
Unit 1	**Introduction to Silicates - I** • Systematic Study of Neso-, Soro-, Cyclo-, Ino-silicate minerals with reference to their chemical formula, structure, classification and occurrences. • Elementary study of Native elements, Carbonates, Oxides and Halides groups.	**15**
Unit 2	**Introduction to Silicates - II** • Systematic Study of Phyllo- and Tecto-silicate minerals with reference to their chemical formula, structure, classification and occurrences. • Elementary study of Sulphates, Sulphides and Phosphates Groups.	**15**
Unit 3	**Optical Mineralogy** • Introduction to Petrological microscope; parts and accessories. • Nature of Light, Phenomenon of Polarization, Snell's law of Reflection, Refraction, Double Refraction. Construction of Nicol Prism, Passage of Light through Nicol Prism. • Properties of Isotropism, Anisotropism. R.I. of Minerals, Beck's Test and Its Effects. Twinkling, Pleochroism, Extinction. • Elementary study of Interference Colors and Twinning.	**15**

Suggested readings:

- Read, H. H. (1966) Rutley's Elements of Mineralogy 26th Edition, S. K. Jain and CBS Publishers and distributors.
- Cornelius K, and Cornelius S. H. (1895) Manual of Mineralogy John Wiley & Sons.
- Hurlbut, C. S., & Klein, C. (1977). Manual of mineralogy (after James D. Dana). Wiley.

Note: Students may refer variety of material available online and on web resources for further understanding.

SEMESTER IV:
Mineralogy
(Course code: MN GEO – 406-P) Credit: 1

Practical/ Lab course

Course Outcome

After the completion of the course the students will be able to:

1. Learn concept of optics.
2. Basic understanding of petrological microscope.
3. Students will learn identification of minerals in thin sections.
4. Descriptive study of mineral sections.

DISCIPLINE SPECIFIC CORE COURSE						
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*PRACTICAL*		
				Credits	*Lectures*	*INTERNAL/ External*
Diploma Course	**B.Sc IV**	**MJ GEO – 406-P**	**Mineralogy**	**1**	**30 hrs**	***25 (15+10) Marks***

- Study of various rock forming minerals in thin sections;
    - Quartz, Orthoclase, Microcline, Plagioclase, Muscovite, Biotite, Hornblende, Hypersthene, Augite-diopside, Olivine, Tourmaline, Calcite, Sphene, Garnet, Staurolite, Kyanite, Sillimanite, Tremolite-actinolite, Nepheline

Note: Additional practical related to syllabus may be included during class work.

Journal / Field Report/ Submission

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SEMESTER IV:
Paper: MN GEO - 407: Geomorphology
(Course code: MN GEO - 407) Credit: 3

GEOLOGY SPECIFIC CORE COURSE							
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*THEORY*			
				Credits	*Lectures*	*External*	*Internal*
Diploma Course	**B.Sc.-IV**	*MN GEO-407*	*Geomorphology*	**3**	**45**	*40 Marks*	*35 Marks*

UNIT	*TOPIC*	*No. of Lectures* **(45 hrs)**
Unit 1	**Introduction to Geomorphology** • Introduction to Geomorphology and Geomorphic process; endogenic, exogenic. • Introduction to weathering: physical, chemical and biological. • Concepts of geomorphology • Introduction to Eustasy and Sea Level change.	**15**
Unit 2	**Fluvial and Aeolian systems.** • Fluvial Processes; Introduction to River Basin and Drainage network. • Genetic classification of stream, Types of drainage patterns. • Erosional and depositional landforms of fluvial system. • Aeolian Processes and Landforms.	**15**
Unit 3	**Glacial, coastal systems and Karst topography** • Glacial Processes, erosional and depositional landforms • Coastal Processes, erosional and depositional landforms • Karst topography – essential conditions to development of karst, features characteristics of karst region. important karst regions.	**15**

Suggested readings:

- Bloom A. L. Geomorphology: A Systematic analysis of late Cenozoic landforms. (3rd Ed.)
- Thornbury, W.D. Principles of geomorphology. CBS Pub. Delhi
- Mukherjee, P. K. (1997) A text book of Geology, The World Press Pvt. Ltd., Calcutta.

Note: Students may refer variety of material available online and on web resources for further understanding.

SEMESTER IV:
Geomorphology
(Course code: MN GEO – 408-P) Credit: 1

Practical/ Lab course

Course Outcome

After the completion of the course the students will be able to:

1. Basic understanding of drainage patterns.
2. Students will learn morphometric analysis of the basin.
3. Develop skills for landform identification from satellite imageries.
4. Understand geomorphic processes in field.

DISCIPLINE SPECIFIC CORE COURSE						
COURSE	*SEMESTER*	*COURSE CODE*	*COURSE TITLE*	*PRACTICAL*		
				Credits	*Lectures*	*INTERNAL/ External*
Diploma Course	**B.Sc IV**	**MN GEO – 408-P**	**Geomorphology**	**1**	**30 hrs**	*25 (15+10) Marks*

- Drainage mapping and drainage pattern identification from satellite imageries.
- Drainage Morphometric analysis.
- Extraction of landforms of Fluvial system
- Extraction of landforms of Coastal system.
- Extraction of landforms of Aeolian system.
- Extraction of landforms of Glacial origin.
- Geomorphic features identification in field.

Note: Additional practical related to syllabus may be included during class work.

Journal / Field Report/ Submission

Note: It is compulsory to record laboratory work (all the practicals) in the journal. The journal is to be certified by the incharge teacher and the Head of the Department within time frame. Certified journal must be produced while appearing at the time of Practical examination.

SEMESTER III:

Skill Course - 2

(Course code: SEC GEO -2 P) Credit: 2

Practical/ Lab course

Course Outcome

After the completion of the course the students will be able to:

1. Developing skill with respect of fossils observation and identification.
2. Understanding fossils morphology and nomenclature.
3. Understanding fossils excavation techniques.
4. Developing filed work skills and report writing skills.

DISCIPLINE SPECIFIC CORE COURSE						
COURSE	***SEMESTER***	***COURSE CODE***	***COURSE TITLE***	***PRACTICAL***		
				Credits	***Lectures***	***INTERNAL/ External***
Diploma Course	**B.Sc -IV**	**SEC GEO -2 P**	**Skill Course - 2**	**1**	**30 hrs**	***25 (15+10) Marks***

Unit-1: Laboratory skills in Image interpretation and its applications.

- Interpretation of Topographic maps
- Learning Google Earth Pro software and GPS.
- Identification of structural and geomorphic features from satellite imageries.

Unit-2: Laboratory skills in Mineral studies.

- Megascopic study of specific rock forming mineral.
- Study of decorative and minerals in laboratory.
- Mineral identification and sample collection in field.

Note: Additional practical related to syllabus may be included during class work/field work.

Journal / Field report/ Submission

Note: It is compulsory to record laboratory work (all the practicals) in the journal. The journal is to be certified by the incharge teacher and the Head of the Department within time frame. Certified journal must be produced while appearing at the time of Practical examination.

KSKV Kachchh University, Bhuj - Kachchh

(Effective from June 2024-25 UNDER NEP-2020)

SEMESTER III and IV

UNIVERSITY PRACTICAL EXAM PATTERN

There will be a Three Exercise in each practical, as under, total of 20 Marks.
(1) Practical exercise (15 marks) (2) Viva (3 marks) (3) Practical Journal (2 marks)

Duration of Exam: 3 Hrs. or more as per practical module.
Examiner will submit marks out of 10 to university.
Passing standard: 4 Marks out of 10 Marks

Note: Student shall not be allowed to appear in the examination if he does not produce certified journals.

KSKV Kachchh University, Bhuj - Kachchh

(Effective from June 2024-25 UNDER NEP-2020)

SEMESTER III and IV

UNIVERSITY PRACTICAL EXAM PATTERN -SEC

There will be a Three Exercise in each practical, as under, total of 25 Marks.

- Practical exercise -1 (10 marks)
- Practical exercise -2 (10 marks)
- Viva (3 marks)
- Practical Journal (2 marks)

  Duration of Exam: 3 Hrs or more as per practical module.