Name of University	**University of Rajasthan, Jaipur**
Name of Faculty	**Arts/Commerce/Fine Arts/Social Science/Social Science**
Name of Discipline	**[Subject Name]**
Type of Discipline	**Major/ MDC**
List of Programme were offered as Minor Discipline	
Offered to Non-Collegiate Students	**Yes**

SEMESTER-WISE PAPER TITLES WITH DETAILS

Course code UG0802/UG0803 - B.Sc								
				GEOLOGY	**Credits**			
#	Level	Semester	Type	Title	L	T	P	Total
1.	6	III	MJR	GEL -63T-201 Igneous and Metamorphic Geology	4	0	0	4
2.	6	III	MJR	GEL -63P-202 Geology Lab	0	0	2	2
3.	6	IV	MJR	GEL -64T-203 Palaeontology and Sedimentology]	4	0	0	4
4.	6	IV	MJR	GEL -64P-204 Geology Lab	0	0	2	2

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Examination Scheme

1. 1 credit = 25 marks for examination/evaluation
2. For Regular Students there will be Continuous assessment, in which sessional work and the terminal examination will contribute to the final grade. Each course in Semester Grade Point Average (SGPA) has two components- Continuous assessment (20% weightage) and (End of end-semester examination) EoSE (80% weightage).
3. For Regular Students,75% Attendance is mandatory for appearing in the EoSE.
4. To appear in the EoSE examination of a course/subject a regular student must appear in the mid-semester examination and obtain at least a C grade in the course/subject.
5. Credit points in a Course/Subject will be assigned only if, the regular student obtains at least a C grade in the CA and EoSE examination of a Course/Subject.
6. In the case of Non-Collegiate Students there will be no Continuous assessment and credit points in a course/subject will be assigned only if, the non-collegiate student obtains at least a C grade in the EoSE examination of a Course/Subject.

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Examination Scheme for Continuous Assessment (CA)

DISTRIBUTION OF CONTINUOUS ASSESSMENT (CA) MARKS

S. No.	CATEGORY	Weightage (out of total internal marks)		THEORY					PRACTICAL		
				CORE (Only Theory)	CORE (Theory + Practical)	AEC	SEC	VAC	CORE (Theory +Practical)	SEC	VAC
	Max Internal Marks			30	20	20	10	10	10	10	10
1	Mid-term Exam	*50%*		15	10	10	5	5	5	5	5
2	Assignment	*25%*		7.5	5	5	2.5	2.5	2.5	2.5	2.5
3	Attendance	*25%*		7.5	5	5	2.5	2.5	2.5	2.5	2.5
		Regular Class Attendance	= 75%	3	2	2	1	1	1	1	1
			75-80%	4	3	3	1.5	1.5	1.5	1.5	1.5
			80-85%	5	4	4	2	2	2	2	2
			> 85%	7.5	5	5	2.5	2.5	2.5	2.5	2.5

Note:

1. Continuous assessment will be the sole responsibility of the teacher concerned.
2. For continuous assessment no remuneration will be paid for paper setting, Evaluation, Invigilation etc.
3. For continuous assessment Paper setting and Evaluation responsibility will be of teacher concern.
4. For continuous assessment no Answer sheets/question papers etc. will be provided by the University.
5. Colleges are advised to keep records of continuous assessment, attendance etc.

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	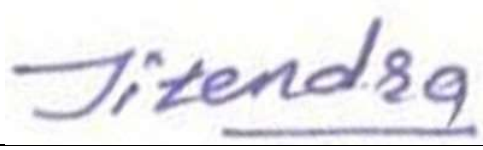	

Examination Scheme for EoSE-

Regular Students –

Type of Examination	Course Code and Nomenclature	Duration of Examination		Maximum Marks	Minimum Marks
Theory/ Practical	Course code UG0802/UG0803 - B.Sc Geology	EoSE	03 Hrs	80 Marks	32 Marks
		EoSE	4 Hrs	40 Marks	16 Marks

The theory question paper will consist of **two** parts **A**&**B**.

PART-A: 20 Marks

Part A will be compulsory having 10 very short answer-type questions (with a limit of 20 words) of two marks each.

PART-B: 60 Marks

Part B of the question paper shall be divided into four units comprising question numbers 2-5. There will be one question from each unit with internal choice. Each question will carry 15 marks.

Practical Examination scheme for Regular students

Duration: 4 hours

Max. Marks: 40 (**Exercise**: 30, **Record**: 05, Viva-Voce: 05)

Non-Collegiate Students –

Type	Course Code and Nomenclature	Duration of Examination	Maximum Marks (EoSE)	Minimum Marks (EoSE)
Theory /Practical	Course code UG0802/UG0803 - B.Sc Geology	3 Hrs	100	36
		4 Hrs	50	18

The question paper will consist of **two** parts **A** & **B**.

PART-A: 20 Marks

Part A will be compulsory having 10 very short answer-type questions (with a limit of 20 words) of two marks each.

PART-B: 80 Marks

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Part B of the question paper shall be divided into four units comprising question numbers 2-5. There will be one question from each unit with internal choice. Each question will carry 20 marks.

Practical Examination scheme for Non-Collegiate students

Duration: 4 hours

Max. Marks: 50 (Exercise: 40, **Viva-Voce**: 10)

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Detailed Syllabus

SEMESTER: III

Type of Examination	Course Code and Nomenclature	Duration of Examination		Maximum Marks		Minimum Marks	
Theory	GEL -63T-201 Igneous and Metamorphic Geology	CA	01 Hr	CA	20 Marks	CA	08 Marks
		EoSE	03 Hrs	EoSE	80 Marks	EoSE	32 Marks
Credit of the Course	4						
Course Objectives	To acquire knowledge on origin, textre, structures, processes of formation, and classification of different types of igneous and metamorphic rocks.						

Unit- 1

Definition, origin and composition of magma; intrusive and extrusive forms; structure and texture of plutonic, hypabyssal, and volcanic rocks. Elements of classificationof igneous rocks and IUGS Classification. Bowen's Reaction Principle, Magma differentiation and assimilation.

Unit- II

Phase and Component, Crystallisation of uni-component (SiO_2) and bi-component silicate melts;eutectic and solid solution crystallization. Study of important igneous rocks; granite-rhyolite, gabbro-dolerite-basalt, pegmatite, syenite, diorite and peridotite.

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Unit- III

Metamorphism: agents and types. Concept of index minerals, grade and facies. Texture, and structure of metamorphic rocks. Cataclastic, thermal and regional metamorphism.

Unit- IV

Regional metamorphism of argillaceous and calcareous rocks. Retrograde metamorphism and metasomatism. Study of important metamorphic rocks;slate, phyllite, schist, gneiss, migmatite, eclogite, quartzite, and marble.

Practical

Practical	GEL -63P-202 Geology Lab	**CA**	**1 Hr**	**CA**	**10 Marks**	**CA**	**04 Marks**
		EoSE	**04 Hrs**	**EoSE**	**40 Marks**	**EoSE**	**16 Marks**
Credit of the Course	**2**						
Course Objectives	To make students able identify the various rock types through studying the physical properties and microscopic studies.						

Practical Examination scheme:

Duration: 4 hours **Max. Marks: 40**

Exercise: 30 marks

Igneous Rocks: Diagrams of different forms of igneous rocks. Textures of plutonic, hypabyssal and volcanic rocks. Hand-specimen study of the following igneous rocks;granite, pegmatite, nepheline syenite, diorite, gabbro, dunite, peridotite, basalts, and trachyte. Petrographic study of granite-rhyolite, gabbro-dolerite-basalt, pegmatite, and syenite.

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Metamorphic rocks: Textures and structures of metamorphic rocks.Hand-specimen and petrographic study of the following rocks types: schist, gneiss, marble, quartzite and migmatite.

Record- 05 marks
Viva-Voce: 05 marks

Book Recommended

1. Tyrell, G.W., The principles of Petrology, Metheum& Co. London.
2. Winter, J.D.,Principles of Igneous and Metamorphic Petrology, Pearson, Delhi.
3. William, Turner & Gilbert, Petrography, CBS Publisher, Delhi.
4. Philpotts and Ague,Principles of Igneous and Metamorphic Petrology, CUP.
5. Best, M.G., Igneous and Metamorphic Petrology, Wiley-Blackwell

Suggested E-resources:

1. https://egyankosh.ac.in/simple-search?query=geology

Learning Outcome of the course: After successful completion of this course, the student will be able to:

1. Understand the magma generation and formation of igneous rocks.
2. Understand the texture of rocks and its implications.
3. Understand petrogenesis of igneous and metamorphic rocks.
4. Understand factors of metamorphism, and to classify metamorphic rock

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SEMESTER: IV

Type of Examination	Course Code and Nomenclature	Duration of Examination		Maximum Marks		Minimum Marks	
Theory	GEL -64T-203 Palaeontology and Sedimentology	CA	01 Hr	CA	20 Marks	CA	08 Marks
		EoSE	03 Hrs	EoSE	80 Marks	EoSE	32 Marks
Credit of the Course	4						
Course Objectives	This course is designed to give the introductory idea about origin of life, fossils: definition, processes, and index fossils. Uses of Fossils in reconstruction of evolutionary history of life, paleoeenvironment, palaeoecology, palaeogeography etc. To give elementary knowledge about the origin, processes and types of sedimentary rocks.						

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Unit- 1

Definition, Scope, sub-division, and relationship of palaeontology with other branches. Fossilization and fossil record Nature and importance of fossil record; Fossilization processes and modes of preservation. Species concept with special reference to paleontology. Taxonomic hierarchy. Theory of organic evolution interpreted from fossil record.

Unit- II

Invertebrate Palaeontology: Brief introduction to important invertebrate groups: Brachiopods, Mollusca (Bivalves, Gastropods and Cephalopods - Nautiloids, Ammnoids, Coleoids), Trilobites, Echinoids, Crinoids, Corals and their significance. Introduction to Paleobotany, Gondwana flora of India and their significance in reconstruction of palaeoclimate.

Unit- III

Origin of sediments: Weathering (Physical and chemical weathering). Fluid flow, sediment transport and sedimentary structures: Types of fluids, Laminar vs. turbulent flow, Particle entrainment, transport and deposition. Sedimentary textures and structures. Classification of sedimentary rocks. Diagenesis.

Unit- IV

Origin, occurrence and characteristics of common sedimentary rocks; Siliciclastic rocks(Conglomerates, sandstones, mud rocks), Carbonate rocks (limestone, Dolostone and dolomitisation). Sedimentary environments and facies.

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Practical

Practical	GEL -64P-204 Geology Lab	**CA**	**1 Hr**	**CA**	**10 Marks**	**CA**	**04 Marks**
		EoSE	**04 Hrs**	**EoSE**	**40 Marks**	**EoSE**	**16 Marks**
Credit of the Course	**2**						
Course Objectives	To give elementary knowledge about the Morphology of ancient organism and their						

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	relationship with the environment through the study of hand specimens of various fossils recovered from different parts of the country. To make students able to indentify various sedimentary rocks through characteristic properties and microscopic studies.

Practical Examination scheme:

Duration: 4 hours **Max. Marks: 40**

Exercise: 30 marks

Palaeontology: Study of diagnostic morphological characters, systematic position, stratigraphic position, age of various invertebrate, and plant fossils.

Sedimentology: Study of mega structures, textures and mineralogy of sedimentary rocks.

Petrography of clastic and non-clastic rocks through hand specimens and thin sections.

Record 05 marks
Viva-Voce 05 marks

Books recommended.

1. Michael Benton, David A. T. Harper, (2009). Introduction to Paleobiology and the Fossil Record, Wiley Blackwell.
2. Clarkson, E. N. K. (2012). Invertebrate paleontology and evolution 4th Edition by Blackwell Publishing.
3. Clare Milsom and Sue Rigby (2010). Fossils at a Glance. Wiley-Blackwell. (Second Edition).
4. Peter Doyle (1996). Understanding Fossils: An Introduction to Invertebrate Palaeontology
5. Prothero, D.R. 1998. Bringing fossils to life - An introduction to PaJaeobiology, McGraw Hill.
6. Lehmann, U., Hillmer, g. 1983; Fossil Invertebrates, Cambridge University Press.
7. Nield, E.W. and Tucker V.C.T., 1985; Palaeontology-An Introduction, Pergamon Press.
8. Benton, M. (2014). Vertebrate Palaeontology, 4th Edition. John Wiley & Sons.
9. Shukla, A. C., & Misra, S. P. (1975). Essentials of paleobotany. Vikas Publisher.
10. Prothero, D. R., & Schwab, F. (2004). Sedimentary geology. Macmillan.

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11. Tucker, M. E. (2006) Sedimenary Petrology, Blackwell Publishing.

12. Collinson, J. D. & Thompson, D. B. (1988) Sedimentary structures, Unwin- Hyman, London.

13. Nichols, G. (2009) Sedimentology and Stratigraphy Second Edition. Wiley Blackwell

14. Sam Boggs V th Edition (2016). Principles of Sedimentology and Stratigraphy.

Suggested E-resources:

1. https://egyankosh.ac.in/simple-search?query=geology

2. https://www.digitalatlasofancientlife.org/

Learning Outcome of the course: After successful completion of this course, the student will be able to:

1. Know about fossils and their significance in understanding the evolutionary history of life on the earth.
2. Understand the changes that occurred in the history of the earth and their effects on diversity of life through the geological times.
3. Know about the processes from production of sediments to their conversion into sedimentary rocks. 4. Know the types of sedimentary rocks and their genesis, depositional environments of sedimentary rocks.

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