Credit Allocation and Marks Distribution for the Undergraduate Course in Geology (Major) under CBCS
Department of Geology, Presidency University, Kolkata

2nd year Semester	Course Type	Paper Code	Course Name	Credits			Marks			
				Th	Pr	Tu	Th	Pr	Tu	Total
Third	Core Course	GEOL03C5	Sedimentology	4	2		70	30		100
Third	Core Course	GEOL03C6	Igneous Petrology	4	2		70	30		100
Third	Core Course	GEOL03C7	Palaeontology	4	2		70	30		100
Third	Generic Elective	GEOL03GE3 A* /B*	Fossils & their Applications / Martian Geology	5/5		1/1	80/80		20/20	100
Third	Skill Enhancement	GEOL03SEC1	Fieldwork - 1	4			100			100
Fourth	Core Course	GEOL04C8	Metamorphic Petrology	4	2		70	30		100
Fourth	Core Course	GEOL04C9	Principles of Stratigraphy and Precambrian Stratigraphy of India	5		1	80		20	100
Fourth	Core Course	GEOL04C10	Phanerozoic Stratigraphy of India	5		1	80		20	100
Fourth	Generic Elective	GEOL04GE4 A*/B*	Global Tectonics and Supercontinent Cycles / Resource Geology	4/4	2/2		70/70	30/30		100
Fourth	Skill Enhancement	GEOL04SEC2	Fieldwork - 2	4			100			100

Th: Theory Pr. Practical Tu: Tutorial

Students of Geology (Major) will have to study **one 6 –credit GENERIC ELECTIVE COURSE every semester**, to be selected from any of the courses offered by Departments other than Geology

*Offered by the Department preferably to students of Science Faculty having Major other than GEOLOGY will be offered to those who successfully qualify GEOL01GE1

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GEOL06DSE4A: Advanced Field Training in Sedimentology, Palaeontology and Economic Geology

Credits - 6: (Theory- 05, Practical- 01)

Theory

Credit : 5

The field work will be carried out in two phases following two modules of the syllabus preferably for duration of up to two weeks for each field work. There will be no written examination in this DSE paper. The evaluation will be done partly on a continuous assessment basis and partly on the basis of Field Report.

Module-A: ***Ancient and modern depositional environments: Sediments and Biota***

1. Interpretation of sedimentary structures, Facies analysis, Factors controlling the nature and distribution of facies.
2. Identification of depositional environments, Evolution over time from sediment to sedimentary rock.
3. Stratigraphy and stratigraphical principles, Stratigraphic architecture - a hierarchical study of bounding surfaces.
4. Study of Palaeontological features in field and their interpretations.
5. Taphonomic analysis – live-dead (bioerosion, encrustation etc.) and live-live interaction (predation etc.).
6. Biozonation and correlation.
7. Ichnology and its relation with depositional environment.
8. Sample collection and preparation methods.
9. Analysis of samples and data collected in field.
10. Preparation of a comprehensive field report.

Module-B: ***Economic deposit survey***

1. Study of regional Geology of the target area.
2. Study of lithological association.
3. Identification of ore and host rock units.
4. Study of mode of occurrences and structures of the ore and host rock units.
5. Understanding of mining systematics by opencast and/or underground mine visit.
6. Preparation of a comprehensive field report.

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GEOL06DSE4B: River Science

Credits - 6: (Theory- 04, Practical- 02)

Theory

Credit : 4

Contact Hours per Week : 4

- **Unit 1: Stream hydrology**

Basic stream hydrology and physical properties of water, sediment and channel flow
River discharge, River hydrographs and its application in hydrological analysis

- **Unit 2: River basins and drainage**

Drainage network
Quantitative analysis of network organization - morphometry
Sedimentation, transportation and erosional processes in rivers

- **Unit 3: Fluvial Geomorphology**

Dynamics of alluvial rivers
Different classification approaches in fluvial geomorphology and its applications.
Bedrock channels, Bedrock incision process
River response to climate, tectonics and human disturbance

- **Unit 4: Fluvial hazards and stream management**

Flood frequency and estimation methods
Integrated approach to stream management with Indian examples

- **Unit 5: River ecology and Riparian bio-diversity**

Introduction to river ecology
Riparian environments for Indian rivers

Practical Credit: 2 Contact Hours per Week: 4

- Stream power calculation
- Hydrograph analysis and other related problems
- Mapping of major river basins

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Suggested Reference Books:

- Davies, T. (2008) Fundamentals of hydrology. Routledge Publications.
- Knighton, D. (1998) Fluvial forms and processes: A new perspective. Arnold Pubs.
- Richards, K. (2004) Rivers: Forms and processes in alluvial channels. Balckburn Press.
- Bryirely and Fryirs (2005) Geomorphology and river management. Blackwell Pub.,
- Julien, P.Y. (2002) River Mechanics. Cambridge University Press.
- Robert, A. (2003) River Processes: An introduction to fluvial dynamics. Arnold Publications.
- Vanoni, V.A. (2006) Sedimentation Engineering. ASCE Manual, Published y American Society of Civil Engineering,

GEOL06DSE4C: Low-temperature Geochemistry

Credits - 6: (Theory- 05, Tutorial- 01)

Theory

Credit : 5

Contact Hours per Week : 5

Assessment type: End Sem Examination of Theoretical type (80 marks).Tutorial will be continuously assessed / assignment based (20 marks)

Introduction

Equilibrium thermodynamics and geochemical reaction kinetics
Acid-Base reactions
Silicate weathering
Adsorption, desorption and redox reactions
Surface water quality
Geochemistry of natural waters
Biogeochemical cycles of carbon, nitrogen, phosphorus and sulphur

Low-temperature Geochemistry (Practical – 1 Credits)

Laboratories work will involve measuring surface water quality and biological oxygen demand.

Suggested Reference Books

- E.A. Keller (2010): Environmental Geology (9th Edition). Pearson
- Adriano D.C. 2001. Trace elements in the terrestrial environment. 2nd ed. Springer-Verlag.
- Drever J.I. 1998. The geochemistry of natural waters: surface and groundwater environments, 3rd ed. Chapters 6, 8. Prentice Hall, Upper Saddle River.
- Killops S.D., Killops V.J. 2005. An introduction to organic geochemistry. 2nd ed. Blackwell Publishing, Malaysia.
- Milllero F., Sohn M. 1992. Chemical oceanography. Chapter 8. Organic compounds. CRC Press, Boca Raton.
- Thurman E.M. 1985. Organic geochemistry of natural waters. Martinus Nijhoff/ Dr W. Junk Publishers, Dordrecht.

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COURSE-STRUCTURE

Applied Geology-M. Sc.

PG Semester I (Total Marks: 250)

Paper	Group	Subject	Marks [Taught Course (35+15)] / Sessional [Lab/Field/Project (50)	Credits
GEOL0701		IGNEOUS PETROLOGY	50 (35+15)	4
GEOL0702		METAMORPHIC PETROLOGY	50 (35+15)	4
GEOL0703		STRUCTURAL GEOLOGY AND CRUSTAL DEFORMATION	50 (35+15)	4
GEOL0791		ISOTOPE GEOLOGY AND GEOCHRONOLOGY	50	4
GEOL0792		GEOSTATISTICS	50	4

PG Semester II (Total Marks: 250)

Theory

Paper	Group	Subject	Marks [Taught Course (35+15)] / Sessional [Lab/Field/Project (50)	Credits
GEOL0801		SEDIMENTOLOGY	50 (35+15)	4
GEOL0802		PALAEONTOLOGY	50 (35+15)	4
GEOL0803		HYDROGEOLOGY	50 (35+15)	4
GEOL0891	A	ELECTIVE 1A	50	4
	B	ELECTIVE 1B		
GEOL0892		FIELD WORK*	50	4

Subjects under elective 1A: LARGE IGNEOUS PROVINCE (LIP)/ TECTONIC PROCESSES THROUGH TIME/ GEOARCHEOLOGY/ PRECAMBRIAN STRATIGRAPHY OF INDIA IN A GLOBAL PERSPECTIVE

Subjects under elective 1B: GEOMATHEMATICS AND COMPUTER APPLICATIONS/PHANEROZOIC STRATIGRAPHY OF INDIA IN GLOBAL PERSPECTIVE/ MICROSTRUCTURE AND FABRIC DEVELOPMENT/ FUNDAMENTALS OF OCEANOGRAPHY

***Field Work of two (02) weeks duration (Compulsory)**

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