

## Minor Courses in Geology–Group1 SLOT –B

rogramme	B.Sc.Geology				
CourseCode	GEL1MN102				
Course Title	<b>GEOINFORMATICS-I</b>				
TypeofCourse	Minor				
Semester	I				
Academic Level	100 -199				
Course Details	Credit	Lecture perweek	Tutorial perweek	Practical perweek	Total Hours
	4	3	-	2	75
Pre-requisites	NIL				
Course Summary					

### CourseOutcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	EvaluationTools used
CO1	Students will acquire knowledgeofthekeysciences andtechnologiesinvolvedin geoinformatics	U	F	Exam
CO2	Studentswilllearnaboutthe origin and development of GIS, itscomponentsand its corefunctions	Ap	C	Quiz
CO3	Students will understand the advantagesandlimitationsof differentGISplatforms	An	P	Assignment
CO4	Studentswillunderstandthe principlesandtechniquesof map-making, and map projectiontypes	E	M	Viva
CO5	Students will grasp the fundamentalconceptsof remotesensing	Ap	F	Assignment
CO6	Studentswillbeabletodefine and explain the meaning and scope of geoinformatics, and understand its importance in various fields	E	M	Assignment

\*-Remember(R),Understand(U),Apply(Ap),Analyse(An),Evaluate(E),Create(C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) MetacognitiveKnowledge(M)

**Detailed Syllabus: GEOINFORMATICS-I**

Module	Unit	Content	Hrs	Marks
<b>I</b>	<b>Introduction to GIS</b>		<b>15</b>	<b>20</b>
	1	Meaning and scope of Geoinformatics		
	2	Sciences and technologies involved – Remote Sensing, GIS, Cartography, Photogrammetry		
	3	Origin of GIS		
	4	GIS – definition		
	5	Components – hardware, software, people, methods, data		
	6	Functions – data input and output, visualization, editing, analysis, map design		
	7	Desktop GIS, mobile GIS, web GIS		
	8	Limitations of GIS		
<b>II</b>	<b>Maps</b>		<b>10</b>	<b>15</b>
	9	Maps – to convey location and extent, characteristics, and spatial relationships		
	10	Classification of maps – topographic maps, thematic maps, cadastral maps		
	11	Elements of a map		
	12	Classification of projection – Cylindrical, Conical, Azimuthal		
	13	Map design		
<b>III</b>	<b>Introduction to Remote Sensing</b>		<b>10</b>	<b>15</b>
	14	History of Remote Sensing		
	15	Introduction to aerial photography: overlaps, flight lines, drift, crab, tilt, dead ground		
	16	Geometry of aerial photographs – scale, principal point, perspective centre, fiducial marks, nadir, focal length, airbase, photo base, isocentre, relief displacement.		
	17	Vertical & oblique aerial photographs		
	18	Visual image interpretation & elements of interpretation – tone, texture, shape, association, pattern, shadow, size		
	19	Stereoscopy – Pocket Stereoscope, Mirror Stereoscope, Parallax Bar		
<b>IV</b>	<b>Concept of Remote Sensing</b>		<b>10</b>	<b>20</b>
	20	Stages in Remote Sensing		
	21	Energy Source – EMR, characteristic of EMR – wave nature and particle nature. EMR spectrum		
	22	Blackbody radiation, Stefan Boltzmann's law, Wein's displacement law		
	23	Interaction of EMR with atmosphere – reflection, scattering, absorption		
	24	Interaction of EMR with earth's surface features – reflection, transmission		
	25	Spectral Reflectance of land cover – Vegetation, Soil, Water		
<b>V</b>	<b>Practicals</b>		<b>30</b>	<b>10</b>
	1	Interpretation of aerial photographs		
	2	Interpretation of topographic sheets		
	3	Downloading of topographic sheets		

### Mapping of COs with PSOs and POs:

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	-	-	-	-							
CO2	2	3	-	-	-	-							
CO3	-	-	1	-	-	-							
CO4	-	-	2	3	-	-							
CO5	-	1	-	-	-	-							
CO6	-	-	-	3	-	-							

### Correlation Levels:

Level	Correlation
-	Nil
1	Slightly/Low
2	Moderate/Medium
3	Substantial/High

### Assessment Rubrics:

Externalevaluation:70marks.InternalEvaluation:30marks

<b>INTERNAL MARKSPLIT-UP(TOTAL 30 MARKS)</b>			
	<b>ComponentsofInternalEvaluation</b>	<b>4Theory Modules (10)</b>	<b>Practical(20)</b>
1	<b>Testpaper/ContinuousEvaluation of PracticalExercises</b>	5	<b>10</b>
2	<b>Seminar/EndSemExam &amp; Viva-Voce</b>	3	7
3	<b>Assignment/Lab Record</b>	2	<b>3</b>

### Mapping of COs to Assessment Rubrics:

	InternalExam	Assignment	Seminar	EndSemesterExaminations
CO1	✓			✓
CO2	✓			✓
CO3	✓			✓
CO4		✓		✓
CO5		✓		✓
CO6			✓	

### References:

1. "IntroductiontoGeographicInformationSystems"byKang-TsungChang (McGraw-Hill Education, 2018)
2. "RemoteSensingandImageInterpretation"byThomasM.Lillesand, RalphW.Kiefer,and Jonathan W. Chipman., (Wiley, 2015)
3. "Geographic InformationSystemsandScience"byPaulA.Longley,MichaelF.Goodchild, David J. Maguire, and David W. Rhind., (Wiley, 2015)

4. "ElementsofPhotogrammetrywithApplicationsinGIS"byPaulR.Wolf,BonA.Dewitt,and Benjamin E. Wilkinson., (McGraw-Hill Education, 2014)
5. "PrinciplesofGeographicInformationSystems"byRolfA.deByandHenkJ.Scholten (ITC,2010)
6. "TheGIS 20: Essential Skills"byGinaClemmer.,(ESRIPress,2013)