BIRLA INSTITUTE OF TECHNOLOGY

CHOICE BASED CREDIT SYSTEM (CBCS) CURRICULUM

(Effective from Academic Session: Monsoon 2022)

M.Sc. Geoinformatics

Department of Remote Sensing

INSTITUTE VISION

To become a Globally Recognised Academic Institution in consonance with the social, economic and ecological environment, striving continuously for excellence in education, research, and technological service to the National needs.

INSTITUTE MISSION

- To educate students at Undergraduate, Post Graduate, Doctoral, and Post-Doctoral levels to perform challenging engineering and managerial jobs in industry.
- To provide excellent research and development facilities to take up Ph.D. programmes and research projects.
- To develop effective teaching learning skills and state of art research potential of the faculty.
- To build national capabilities in technology, education, and research in emerging areas.
- To provide excellent technological services to satisfy the requirements of the industry and overall academic needs of society.

DEPARTMENT VISION:

Be a centre of excellence in the field of Geospatial Technology education and research in the areas of Earth Resources, Environment & Climate to meet the needs of ever increasing requirement of human resources in these fields and to cater to the larger interest of the Society and Nation.

DEPARTMENT MISSION

- Impart quality education and equip the students with strong foundation that could make them capable of handling challenges of the ever advancing geo-spatial technologies.
- Maintain state-of-the-art in research and outreach facilities in phase with the premier institutions for sustained improvement in the quality of education and research.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. To prepare the students in identifying, analysing and solving geospatial problems.

2. To train the students in developing practical and executable solutions to the challenges of growing field of Remote Sensing and GIS.

3. To impart the students with strong base of knowledge that makes them suitable both for industries as well as for teaching and research.

4. To inculcate the students with the sensitivity towards ethics, public policies and their responsibilities towards the society.

PROGRAMME OUTCOMES (POs)

PO1: An ability to independently carry out investigation and development work to solve real life geospatial problems.

PO2: An ability to write and present a substantial technical report/document/international level research articles.

PO3: Students should be able to demonstrate a degree of mastery over the areas of Geoinformatics.

PO4: An ability to share theoretical and practical knowledge in both teaching and research as well as in industries.

PO5: An ability to apply professional ethics, accountability and equity.

PROGRAMME COURSE STRUCTURE (ALL SEMESTERS)

SEMESTER - I

	Course Category	Course Code	Subjects	Mode of Delivery L – Lecture; T – Tutorial; P - Practical			Credits
				L	T	P	
SEMESTER- I	PC	GI 501	Principles of Remote Sensing	3	0	0	3
		GI 502	Geographic Information System	3	0	0	3
		GI 503	Digital Cartography and GPS	3	0	0	3
		GI 504R1	Advanced Image Acquisition and Interpretation for Environmental Mapping	3	0	0	3
		GI 505	Remote Sensing Laboratory	0	0	4	2
		GI 506	Geographic Information System Laboratory	0	0	4	2
		GI 507	Digital Cartography and GPS Laboratory	0	0	4	2
		GI 508	Advanced Image Acquisition and Interpretation for Environmental Mapping Laboratory	0	0	4	2
		MT132	Communication Skills-I	0	0	3	1.5
	OE	**OPEN ELECTIVE**		3	0	0	3
	Total Credits (1st Semester) (Theory + Labs)						**24.5**

SEMESTER – II

	Course Category	Course Code	Subjects	L	T	P	Credits
SEMESTER- II	PC	GI 509R1	Digital Satellite Image Processing	3	0	0	3
		GI 510R1	Research Methods and Statistics in Geoinformatics	3	0	0	3
		GI 511	Digital Satellite Image Processing Laboratory	0	0	4	2
		GI 512R1	Programming and Customisation in Geospatial domain Laboratory	0	0	4	2
		GI 513	Field Study Laboratory	0	0	4	2
		GI 518	Spatial data handling through programming	3	0	0	3
		MT133	**Communication Skills-II**	0	0	3	1.5

	PE	GI*	ELECTIVE – I	3	0	0	3
		GI*	ELECTIVE - I Laboratory	0	0	4	2
	OE	**OPEN ELECTIVE**		3	0	0	3
	Total Credits (2nd Semester)						**24.5**

SEMESTER – III

	Course Category	**Course Code**	**Subjects**	**L**	**T**	**P**	**Credits**
SEMESTER- III	**PC**	GI 601	Project (Part - I)				4
		GI 602	Advanced Geospatial Modelling and Decision Support System	3	1	0	4
		GI 603	Aerial, Satellite, UAV based Photogrammetry & Application	3	1	0	4
		GI 604	Advanced Geospatial Modelling & DSS Laboratory	0	0	4	2
		GI 605	Aerial, Satellite, UAV based Photogrammetry &Application Laboratory	0	0	4	2
	PE	GI*	ELECTIVE – II	3	1	0	4
		GI*	ELECTIVE - II Laboratory	0	0	4	2
	OE	**OPEN ELECTIVE**		3	0	0	3
	Total Credits (3rd Semester)						**25**

SEMESTER – IV

	Course Category	**Course Code**	**Subjects**	**L**	**T**	**P**	**Credits**
SEMESTER- IV	**PC**	GI 611	Project (Part – II)				8
	Total Credits (4th Semester)						**8**

Grand TOTAL =82 credits

*ELECTIVES

Course No.	Course Title

ELECTIVE-I (Spring Session)

GI 514 R1	Geoinformatics for Climate Change and Environmental Impact Assessment
GI 515 R1	Geoinformatics for Hydrology & Water Resources
GI 516	Geoinformatics for Climate Change and Environmental Impact Assessment Laboratory
GI 517	Geoinformatics for Hydrology & Water Resources Laboratory

ELECTIVE-II (Monsoon Session)

GI 606	Geoinformatics for Natural Resource Management
GI 607	Geoinformatics for Disaster Management
GI 608	Geoinformatics for Natural Resource Management Laboratory
GI 609	Geoinformatics for Disaster Management Laboratory

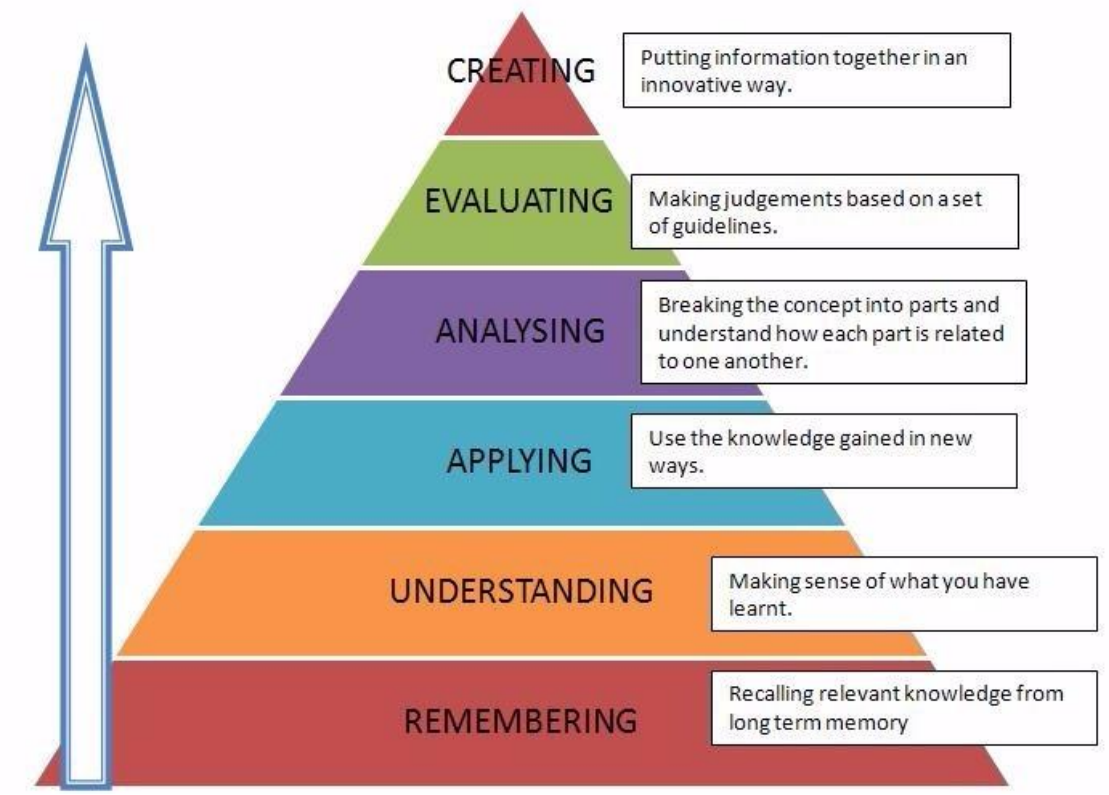
Project (Part – I) – Focus on Problem definition, Literature Review, Data Collection, Objectives and Research Questions Formulation and Detailed Work Plan, and partial fulfillment of initial objectives.

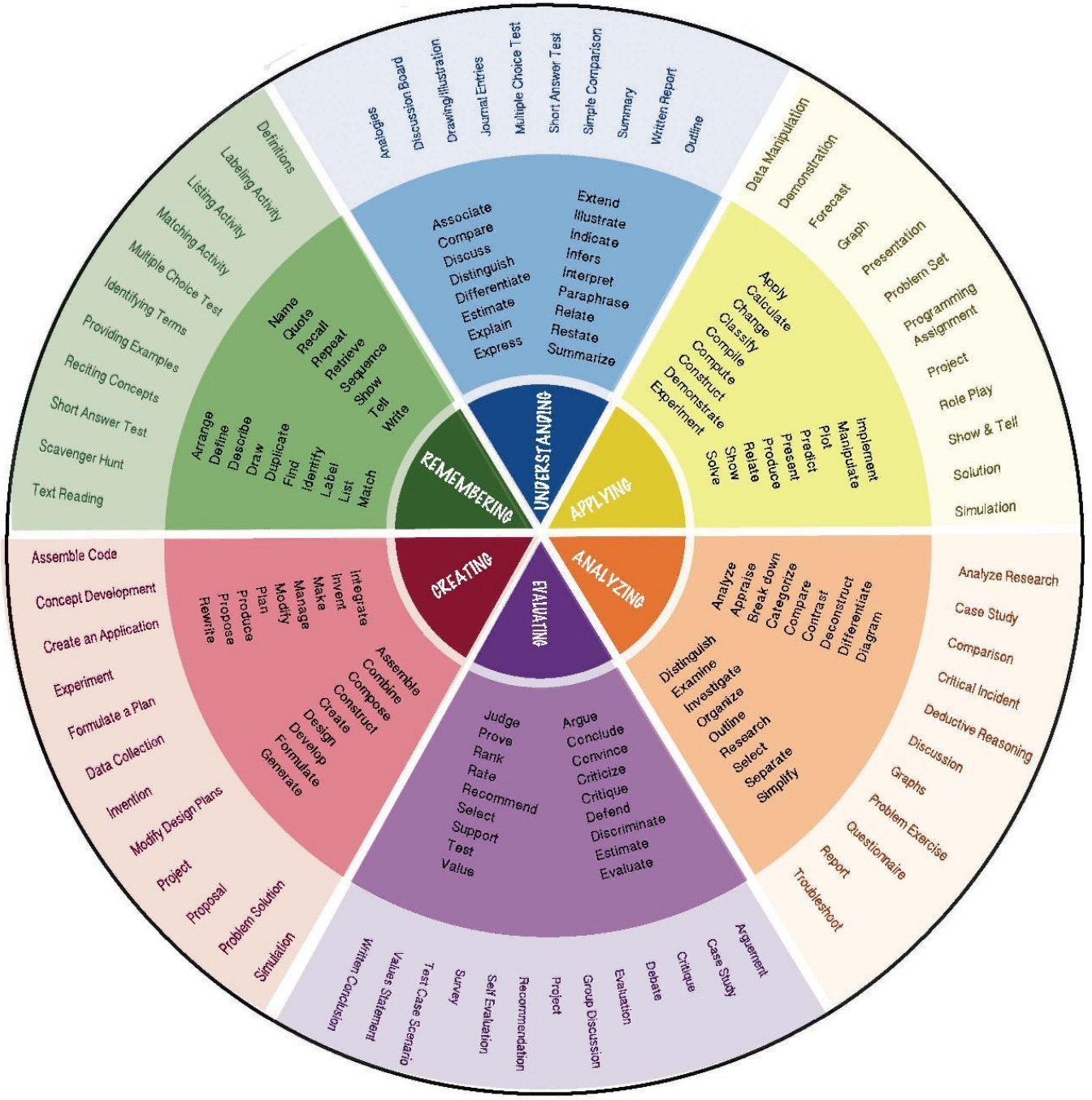
Project (Part – II) – Focus on systematic execution of work plan, data processing, analysis, interpretation, inferences and fulfillment of objectives and research questions, and report preparation, and finally leading to a research publication.

BLOOM'S TAXONOMY FOR CURRICULUM DESIGN AND ASSESSMENT:

Preamble

The design of curriculum and assessment is based on Bloom's Taxonomy. A comprehensive guideline for using Bloom's Taxonomy is given below for reference.




REMEMBERING
UNDERSTANDING
APPLYING
ANALYZING
EVALUATING
CREATING
Name
Quote
Recall
Repeat
Retrieve
Sequence
Show
Tell
Write
Arrange
Define
Describe
Draw
Duplicate
Find
Identify
Label
List
Match
Definitions
Labeling Activity
Listing Activity
Matching Activity
Multiple Choice Test
Identifying Terms
Providing Examples
Reciting Concepts
Short Answer Test
Scavenger Hunt
Text Reading
Associate
Compare
Discuss
Distinguish
Differentiate
Estimate
Explain
Express
Extend
Illustrate
Indicate
Infers
Interpret
Paraphrase
Relate
Restate
Summarize
Analogies
Discussion Board
Drawing/Illustration
Journal Entries
Multiple Choice Test
Short Answer Test
Simple Comparison
Summary
Written Report
Outline
Apply
Calculate
Change
Classify
Compile
Compute
Construct
Demonstrate
Experiment
Implement
Manipulate
Plot
Predict
Present
Produce
Relate
Show
Solve
Data Manipulation
Demonstration
Forecast
Graph
Presentation
Problem Set
Programming Assignment
Project
Role Play
Show & Tell
Solution
Simulation
Analyze
Appraise
Break down
Categorize
Compare
Contrast
Deconstruct
Differentiate
Diagram
Distinguish
Examine
Investigate
Organize
Outline
Research
Select
Separate
Simplify
Analyze Research
Case Study
Comparison
Critical Incident
Deductive Reasoning
Discussion
Graphs
Problem Exercise
Questionnaire
Report
Troubleshoot
Argue
Conclude
Convince
Criticize
Critique
Defend
Discriminate
Estimate
Evaluate
Judge
Prove
Rank
Rate
Recommend
Select
Support
Test
Value
Argument
Case Study
Critique
Debate
Evaluation
Group Discussion
Project
Recommendation
Self Evaluation
Survey
Test Case Scenario
Values Statement
Written Conclusion
Assemble
Combine
Compose
Construct
Create
Design
Develop
Formulate
Generate
Integrate
Invent
Make
Manage
Modify
Plan
Produce
Propose
Rewrite
Assemble Code
Concept Development
Create an Application
Experiment
Formulate a Plan
Data Collection
Invention
Modify Design Plans
Project
Proposal
Problem Solution
Simulation

COURSE INFORMATION SHEET

Course code: GI 611
Course title: Project (Part -II)

Pre-requisite(s): Completion of all Labs of 1st and 2nd semester
Co- requisite(s):

Credits:	**L:**	**T:**	**P:**	**C:**
	0	**0**		**8**

Class schedule per week: 4
Class: M. Sc.
Semester / Level: 03&04/06
Branch: Geoinformatics

Course Objectives: This course aims to make the student with following abilities:

A.	Carry out independent research project addressing real life Geospatial problems with sound scientific framework.
B.	Prepare spatial maps from satellite data and other sources utilising various Geoinformatics techniques and produce research report with acceptable quality and ethics, and communicate results to stakeholders.

Course Outcomes (CO): On completion of this course, students should be able to:

CO1	Collect and summarise relevant existing literatures related to the problem in hand.
CO2	Identify Research Gaps, Develop appropriate research questions and Objectives in relation to their domain of research.
CO3	Design Research Methodology and Create coherent geospatial database and other relevant data for each objective.
CO4	Apply Geoinformatics tools and techniques to evaluate the appropriateness of results in relation to objectives and research questions.
CO5	Integrate and synthesis all results and write a scientifically sound academic report with appropriate referencing, and communicate research findings to stakeholders.

Mapping Course Outcome with Programme Outcome

	PO1	**PO2**	**PO3**	**PO4**	**PO5**
CO1	1	2	2	3	3
CO2	2	3	2	2	3
CO3	3	2	2	3	3
CO4	3	3	3	2	1
CO5	3	3	3	3	3

Correlation Levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)