

## Program Level Learning Outcome (PLO) Assessment for Master of Science in GeoInformatics (MGeol)

**PLO:** Students will acquire a strong conceptual model of how to represent geographic phenomena in space, time and over different scales. The students will be able to translate that conceptual model into data structures or objects that capture the relationships among phenomena being modeled. They will acquire solid quantitative skill that can be used to capture key processes that characterize the system being modeled. They will master the components that comprise GeoInformatics including: cartographic representation, WebGIS, spatial data bases, geocomputation, remote sensing & image processing.

Learning Outcome <sup>1</sup>	Does Not Meet Expectations	Approaches	Reinforces	Masters
1. Develop a strong conceptual model for a geospatial problem.	Unable to design a conceptual model for a problem.	Understand the principles behind a conceptual model.	Can design a conceptual model for a simple problem.	Demonstrate a nuanced understanding of a conceptual model even for the most complex examples.
2. Transform conceptual model to geospatial components.	Unable to make this transformation.	Has a high-level understanding of this transformation	Can make this transformation for simple models	Can make this transformation for complex models.
3. Master geocomputation skills for problem solving.	Unable write simple geo-spatial computer programs.	Can write simple geo-spatial scripts.	Can write complex geo-spatial programs.	Masters ability to creation complex geo-spatial models written in a programming language (e.g. Python).
4. Design and implement a geospatial database environment.	Doesn't understand the basic concepts of geospatial databases.	Understands the concepts of geospatial databases but cannot implement them.	Can implement/stand-up a geospatial database.	Can implement/stand-up a geospatial database and implement a conceptual model as a logical implementation.
5. Comprehend remote sensing principles and master image processing skills	Unable to understand the fundamentals of remote sensing principles or unable to master image processing skills.	Comprehend remote sensing principles, and discover and display spatial and temporal patterns of environmental variables from remote sensing data	Can implement advanced remote sensing algorithms to visualize and analyze 3-D spatial and temporal information of earth system variables using remote sensing data	Can design, develop and implement a complex series of image processing algorithms using image processing tools (ENVI and GEE) to solve real-world environmental problems.
6. Represent and communicate geo-	Unable to effectively represent and clearly communicate geo-	Understand basic principles of cartographic	Can implement specific styles and techniques to represent geo-spatial	Can design, implement, and integrate a set of methods of representation through scripting and programming to

<sup>1</sup> Each PLO can have multiple specific learning outcomes. This PLO has six defined learning outcomes.

spatial information and images.	spatial information and images.	representation and can produce simple static and interactive maps to communicate geo-spatial information and images.	information and images and communicate them with maps, reports, posters, and WebGIS.	communicate geo-spatial information and images in the forms of maps, posters, multimedia, customized WebGIS, and animations.
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