Program Level Learning Outcome Assessment

MS in GeoInformatics

PLO2: Students will transform the conceptual model to geospatial components and a computational model, including the logical and structural design of the solution as well as the computational tools and sequences required to solve the problem.

Learning Outcome	Does Not Meet Expectations	Approaches Expectations	Meets Expectations	Masters
Students will be able to select specific geospatial data models based on conceptual entities.	Cannot distinguish between geospatial data models; selects models arbitrarily or incorrectly (e.g., raster for precise boundary delineation).	Selects an appropriate data model category (vector, raster, network, etc.) but cannot justify the choice or mismatches sub-types (e.g., point vs. polygon).	Correctly selects and justifies geospatial data models (e.g., TIN for terrain, polygon topology for parcels) aligned with conceptual entities.	Evaluates trade-offs between multiple valid data models (e.g., raster resolution vs. storage cost) and selects the optimal model with a documented rationale.
Students will be able to identify the specific sequence of spatial queries and spatial operations to extract meaningful information.	Cannot sequence spatial operations; apply operations randomly or in a logically incorrect order that produces meaningless results.	Identifies relevant operations but sequences them incorrectly or skips critical intermediate steps (e.g., omitting a projection step before overlay).	Constructs a correct, logical sequence of spatial queries and operations (e.g., buffer → intersect → dissolve) that reliably extracts the target information.	Designs an optimized processing chain that minimizes redundancy, accounts for edge cases, and documents each step's purpose and expected output.
Students will be able to translate a geographic process into formal computational logic.	Cannot convert a geographic concept into pseudocode or algorithmic steps; logic is absent or fundamentally flawed.	Produces partial pseudocode or a flowchart that captures the general intent but contains logical gaps or incorrect branching/iteration.	Accurately translates a geographic process into complete, correct pseudocode or a flowchart with appropriate conditionals, loops, and data inputs/outputs.	Produces implementation-ready logic with edge-case handling, efficiency considerations, and clear documentation linking each computational step to its geographic rationale.
Students will be able to specify the statistical or mathematical metrics to evaluate and validate the output of the computational model.	Cannot identify any metrics for model evaluation; accepts outputs without validation.	Suggests a relevant metric (e.g., accuracy) but cannot define it precisely or explain why it is appropriate for the spatial context.	Specifies appropriate validation metrics (e.g., RMSE, kappa coefficient) and explains how each metric relates to the model's purpose and data type.	Designs a comprehensive validation framework including multiple complementary metrics, cross-validation strategies, and thresholds for acceptable model performance.