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Name of the Programme: M.A. in Economics

Course Code: ECO 602 Title of the Course: Techniques of Geo-spatial analysis

Number of Credits: 4

Effective from AY: 2022-23

Prerequisites for the Course:	Basic knowledge of mathematics and statistics as per core requirements in MA Economics	
Objective:	Understand the use of spatial data and its applications in economics	Contact Hours per module
Content:	Module 1: Use of spatial data in economic analysis- Introduction to QGIS - its graphical user interface. Fundamentals of Remote Sensing Signals, Electromagnetic Spectrum, Terms and Units of Measurement, Electromagnetic Radiation Laws, Resolution of a Sensor System,-Spatial, Spectral, Radiometric, Temporal and Angular resolution, sources of information remote sensing data	15 hours
	Module 2: Raster and Vector Data formats- Interacting with data - identifying features, measuring and selecting data, creating shapefile, snapping, topology, attribute table and field calculator, data joins, projections, clipping, analyzing elevation, terrain	15 hours
	Module 3: Interpolation, buffer, Styling layers- raster, terrain, satellite images and landcover map, styling and labeling vector layers- point, line and polygon style, creating 3D map, print layout- map creation, 3D map view.	15 hours
	Module 4: Analyzing raster data- raster calculator, Combining raster and vector data-converting between raster and vector and zonal statistics, Advanced raster and vector analysis with	15 hours

	processing-Finding nearest neighbors, Converting between points, lines, and polygons, Calculating area shares within a region, regression, Reclassify raster layer.	
Pedagogy:	● Chalk and talk aided by ICT enabled lectures ● PC lab exercises ● Assignments and presentations ● Group activity ● MOOC (or similar) Component	
Reference/ Readings:	Core reading C1. Andrew Cutts, Anita Graser(2018), Learn QGIS, Your Step-by-step Guide to the Fundamental of QGIS 3.4, Packt Publishing,4th Edition, Livery Place, UK. C2. Emilio Chuvieco (2016),Fundamentals of Satellite Remote Sensing An Environmental Approach,CRC Press Taylor & Francis Group C3. Quantum Geographic Information System (QGIS) training manual https://docs.qgis.org/3.10/en/docs/training_manual/index.html Additional References A1. Gary E. Sherman(2008), Desktop GIS mapping the planet with open source tools, Pragmatic Bookshelf, Raleigh, North	

	Carolina Dallas, Texas. A2. Otto Huisman, Rolf A. de (2009), Principles of geographic information systems: an introductory textbook, The International Institute for Geo-Information Science and Earth Observation (ITC), Netherlands. A3. Kurt Menke et.al (2016), Mastering QGIS, Packt Publishing, Livery Place, UK. A4. Erik Westra (2014), Building Mapping Applications with QGIS Create Your Own Sophisticated Applications to Analyze and Display Geospatial Information Using QGIS and Python, Packt Publishing, 4th Edition, Livery Place, UK. A5. Jay D. Gatrell, Ryan R. Jensen (2009), Planning and Socioeconomic Applications (Geotechnologies and the Environment), Springer Science & Business Media. A6. J. M. Pogodzinski, Richard M. Kos (2013), Economic Development & GIS, Esri Press.	
Learning Outcomes:	Candidates will be able to a) extract and process spatial images b) use open source GIS software c) Understand how to translate LULC information for economic decision-making.	