

Prerequisite status: -	Unit Type: Basic - Theoretical	The number of units: 2	Name of the lesson: Urban spatial analysis
Type of additional practical training: Has it <input type="checkbox"/> does not have <input checked="" type="checkbox"/> Science travel <input type="checkbox"/> Laboratory <input type="checkbox"/> Workshop <input type="checkbox"/> , Seminar <input type="checkbox"/>		The number of hours: 32	
Goals: Acquaintance of students with the basics, methods, and spatial analysis techniques based on geographic information systems in urban and regional planning.			
Headlines 1- The concept of space (Kantian, Euclidean, etc.) and urban space. 2- The concept of spatial analysis in geography (processes and patterns, spatial data, exploratory analysis of spatial data). 3- Map production and data visualization in spatial analysis. 4- Analyzing the dispersion characteristics of urban phenomena (spatial mean, spatial standard deviation, spatial range, spatial changes). 5- Spatial sampling and familiarization with the types of spatial sampling. 6- Zoning and interpolation of urban phenomena (Interpolation), Kernel and Kriging analysis. 7- Spatial autocorrelation (definitions, clusters and non-clusters, spatial outliers, analysis of hot and cold spots, spatial similarity and dissimilarity, spatial relations and their types). 8- Identification and analysis of spatial extent and intensity of urban phenomena. 9- Point analysis and quadratic analysis methods and their types. 10- Modeling spatial relationships and spatial correlation of urban phenomena. 11- Models and spatial analysis techniques (Local Moran and Local gaery ‘local spatial Autocorrelation). 12- Spatial data mining and cluster analysis. 13- Ordinary Geographic regression. 14- Geographically weighted regression.			
Reference 1- Joyzadeh, Saeed; Haddadi, Sara; Duraninejad, Mohammad Sadegh (2017), Spatial Statistics (Spatial Data Analysis), Academic Publications. 2- Zangi Abadi, Ali; Rezaei, Meisam (2015), Application of GIS in geography, urban planning, and urban development, Sharia Tos, Mashhad. 3- Asgari, Ali (2011), Spatial Statistics Analysis with GIS, Publications of Tehran Municipality Information and Communication Technology Organization.			

- 4- Fazel Nia, Gharib; Belyani, Yadullah; Hakim Dost, Sedyaser (2013), comprehensive guide of GIS application models in urban, rural, and environmental planning, the first volume, Azadpima Publishing, Tehran.
- 5- Mohammadzadeh Darodi, Mohsen (2017), Spatial statistics and its applications, Modares University Publications.
- 6- Hauxhold, William E.; Flower, Eric; Bar, Brian (6696), Application of GIS in urban development and urban planning based on Arc GIS version 10, translated by Mohsen Bahadur, Azad Pima Publications, Tehran.
- 7- Behnisch, M., Meinel, G., (2018). Trends in Spatial Analysis and Modelling: Decision-Support and Planning Strategies, Springer.
- 8- Fotheringham, Stewart and Rogerson P, A. (2009). The SAGE Handbook of Spatial Analysis, SAGE.
- 9- Fotheringham, S., Brunsdon, C., Charlton, M., (2000). Quantitative Geography: Perspectives on Spatial Data Analysis, SAGE.
- 10- Rocha, J., (2018). Spatial Analysis, Modelling, and Planning, www.intechopen.com/books/spatial-analysis-modelling-and-planning.
- 11- Thill, J.C., (2018). Spatial Analysis and Location Modeling in Urban and Regional Systems, Springer.
- 12- Yamagata, Y; Seya, H. (2019) Spatial Analysis Using Big Data: Methods and Urban Applications, Academic Press.