Al al-Bayt University

Faculty of Earth and Environmental Sciences

Master Study Plan template
of Geographic Information Sciences
Thesis Track

2023–2022

Guidance Plan for Master Students Specializing in Geographic Information Sciences

First Year							
First Semester				Second Semester			
Course No.	Course Title	Credits	Learning Type	Course No.	Course Title	Credits	Learning Type
0802711	Advanced digital cartography	3	Face to face	0802722	Advanced GNSS Applications	3	Face to face
0802712	Advanced mapping and geographic projections	3	Blended	0802731	Advanced Applications in Remote Sensing	3	Face to face
0802721	Advanced geospatial data analysis	3	Blended	-	Elective Course	3	Blended
Total		**9**		**Total**		**9**	

Second Year							
First Semester				Second Semester			
Course No.	Course Title	Credits	Learning Type	Course No.	Course Title	Credits	Learning Type
0802732	Advanced processing and analysis of aerial photographs	3	Face to face	0802772	Master's Thesis	6	
-	Elective Course	3	Face to face				
0802772	Master's Thesis	3	Face to face				
Total		**9**		**Total**		**6**	

Description of Courses offered by the Department of Geographical Information System/ Master Degree in Geographic Information Sciences

Course No.	الكارتوجرافيا المتقدمة	(3) Credits	Learning Type
0802711	Advanced digital cartography	Pre-requisite: -	Face to face
This course will focus on the fundamentals of cartography and expand on animated and interactive maps, web mapping, and new visualization techniques, and will focus on projects consisting of web animation, visualization, and/or an interactive map that students individually research, design, and develop and present.			

Course No.	علم الخرائط والإسقاطات الجغرافية المتقدم	(3) Credits	Learning Type
0802712	Advanced mapping and geographic projections	Pre-requisite: -	Face to face
This course will focus on scales used in the production of various maps, geographic location, coordinate systems, interpretation of deformation due to conversion from spherical to flat, classification of projections and their characteristics in terms of advantages and disadvantages, with emphasis on the mathematical calculations that were used to produce these projections and linking this to modern and advanced scientific research that discusses the related issues to the various geographical projections used globally.			

Course No.	التحليل المتقدم للبيانات الجغرافية المكانية	(3) Credits	Learning Type
0802721	Advanced geospatial data analysis	Pre-requisite: 0803711	Face to face
This course will focus on geospatial data analysis tools and geospatial data modeling and analysis methods. It will cover the theories behind the main processing techniques in geospatial data analysis, in addition to their application to real-world problems, how information and knowledge can be extracted from geospatial data, and how to take advantage of geospatial data from the R programming environment, students will implement practical analysis strategies using open source tools.			

Course No.	تطبيقات متقدمة في نظم المعلومات الجغرافية	(3) Credits	Learning Type
0802722	Advanced Applications in Geographical Information Systems	Pre-requisite: -	Face to face
This course will focus on the necessary skills to conduct detailed analysis in geographic information systems (GIS) using basic statistical methods, spatial analysis, and analysis of spatial patterns, linking these processes in the natural environment and human spatial behavior, acquiring the knowledge and skills necessary to develop geoprocessing models, and making decisions related to planning and management in the various GIS applications in the fields of land resources, disaster and crisis management.			

Course No.	نماذج الارتفاعات الرقمية المتقدمة	(3) Credits	Learning Type
0802723	Advanced Digital Elevation Models	Pre-requisite: -	Face to face
This course focuses on the theory and methods of digital elevation data generation, classification, analysis and applications. It includes the topics of GIS terrain data models, photogrammetry and processing of terrain data produced from light and range detection images (LiDAR DEM), digital analysis and modeling of terrain, and 3D terrain visualization, and watershed modeling, where modern and advanced scientific research will be used to discuss issues related to the various applications of terrain data analysis.			

Course No.	قواعد البيانات الجغرافية المكانية واسترجاع المعلومات	(3) Credits	Learning Type
0802724	Geospatial databases and information retrieval	Pre-requisite: -	Face to face
This course will focus on effective and efficient methods for handling geospatial information stored in a variety of formats and mediums. More complex information such as those stored in textual content presents further barriers to processing and analysis. In this course all those issues will be addressed and solutions will be explored. It will also focus will on using spatial SQL databases and R to handle geospatial information.			

Course No.	تطبيقات متقدمة في الاستشعار عن بعد	(3) Credits	Learning Type
0802731	Advanced Applications in Remote Sensing	Pre-requisite: -	Blended
This course will focus on the advanced topics in digital remote sensing applications, image evaluation and initial processing, analysis, interpretation and display of images, and explanation of specific topics including geometric corrections, radiometric correction, image enhancement, image classification, change detection, and analysis and accuracy assessment,. It will focus also on remote sensing applications to a range of fields of Earth resources and disaster and crisis management. Modern and advanced scientific research will be used to understand the various applications of remote sensing at the local, regional and global levels.			

Course No.	المعالجة والتحليل المتقدم للصور الجوية	(3) Credits	Learning Type
0802732	Advanced processing and analysis of aerial photographs	Pre-requisite: -	Blended
This course aims to identify the techniques of processing and digital analysis of aerial photos especially those captured from drones and similar systems (contrast processing, multi-visual processing, image enhancement, conversion, spectral signature, visualization classification and analysis), output and compilation, and modern scientific research will be used. and advanced, which discuss the various mechanisms of dealing with aerial photographs globally.			

Course No.	الأقمار الصناعية والأرصاد الجوية	(3) Credits	Learning Type
0802741	Satellites and Meteorology	Pre-requisite: -	Blended
This course aims to introduce the historical development of satellites used in meteorology, explaining the physics of satellite orbits, tracking and navigation, current meteorological satellite systems, how they work, the mechanism for interpreting their data, strengths and weaknesses in remote sensing meteorological data, and performing practical applications for analyzing and interpreting satellite images to extract weather data.			

Course No.	تطبيقات متقدمة في نظام تحديد المواقع العالمي	(3) Credits	Learning Type
0802742	Advanced GNSS Applications	Pre-requisite: -	Blended
This course will focus on learning how to GPS satellite identify the locations of objects on earth surface, above it as well as in space and know the methods and techniques for determining the size of the earth, its shape and deformation and its change in time using GPS satellites. It will also focus on GPS applications in the fields of earth resources, disaster and crisis management as well as in transportation, navigation and oceanography.			

Course No.	تطبيقات إدارة الكوارث	(3) Credits	Learning Type
0802751	Disaster management applications	Pre-requisite: -	Blended
Explain the importance of the science of geographic information systems and the specificity of geographic information science in supporting decision-making in disaster management in its four stages starting with the stage of disasters prediction before it occurs and the role of geographic information science in building early warning systems and then the stage of preparedness and then the response stage by preparing damage assessment maps and building the Integrated common operational pictures and identification of shelters and evacuation areas, then in the post-disaster recovery and rehabilitation phase.			

Course No.	إدارة المياه الجوفية والمياه السطحية	(3) Credits	Learning Type
0802752	Groundwater and Surface Water Management	Pre-requisite: -	Blended
This course will focus on identifying the origin of groundwater, its location and distribution, rock properties, its relationship to groundwater, groundwater reservoirs, methods of studying groundwater quality, its pollution mechanism, modeling groundwater sources and explaining the mechanisms of natural and artificial groundwater recharge. It will also focus on the clarification of methods for measuring surface water, hydrological designs, surface water quality modeling and pollution mechanism.			

Course No.	التغير المناخي والإدارة البيئة	(3) Credits	Learning Type
0802753	Climate Change and Environmental Management	Pre-requisite: -	
This course will cover the causes and effects of climate change using specialized environmental management studies, introducing the global warming phenomenon and its impact on the environment, assessing the risks of climate change, explaining the causes and consequences of climate change and global warming caused by human activity as well as introducing the global policies to mitigate global warming with respect to reducing the emissions of gases that cause the global warming phenomenon.			Blended

Course No.	منهجية البحث العلمي	(3) Credits	Learning Type
0803736	Methodology of Modern Scientific	Pre-requisite: -	
This course focus on learning the methods of scientific research in arriving at the appropriate information, and how to collect it. It will also focus on scientific ethics in writing correct information and avoiding literal quotes. Also, it will address the research components, writing techniques while observing the scientific foundations. It will also focus on learning the necessary skills for writing research results in a clear manner to ease the understanding of research outcomes.			Blended