# Geospatial Technology

| Gainful Employment | Program Name | Program Type | Area of Study |
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| | Geospatial Technology (9680) , AAS (https://catalog.lakelandcc.edu/degree-certificate-programs/geog/9680/) | Degree | GEOG |
| | Geospatial Technology Certificate (6801) (https://catalog.lakelandcc.edu/degree-certificate-programs/geog/6801/) | Certificate | GEOG |
| | Geospatial Technology Skills Certificate (6802) (https://catalog.lakelandcc.edu/degree-certificate-programs/geog/6802/) | Certificate | GEOG |
| | sUAS Applications in Geospatial Technology Certificate (6803) (https://catalog.lakelandcc.edu/degree-certificate-programs/geog/6803/) | Certificate | GEOG |

**GEOG 1400 Mapping Technologies**                                                                            **3 Credits**
This course introduces students to the use of mapping technologies in the creation, integration, and visualization of spatial data through the use of open source, free, and proprietary software. Students will use mapping technologies, including Unmanned Aerial Systems (UAS), Global Positioning Systems (GPS), and other desktop, web, and mobile applications.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 1500 Introduction to Geography**                                                          **(OT36) 3 Credits**
This course introduces students to geography, including the use of maps and geospatial technology in geography. Major topics include geographic literacy, theories and methods of geography, population and migration, cultural patterns and processes, economic geography, globalization, natural resources, geopolitics, human impact on the environment, and urbanization.
(3 contact hours)

**GEOG 1550 Physical and Environmental Geography**                                **(OT36, TAG) 3 Credits**
This course provides an introduction to the field of physical geography, including the spatial study of the Earth systems in relation to weather, climate, landforms, vegetation and plant distribution, soils, and human interaction with these systems.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 1600 World Regional Geography**                                                   **(OT36, TAG) 3 Credits**
This course examines world regions and their environmental, cultural, social, geopolitical, and economic processes. It views regions and places within the broader context of world change and the interface between globalization and local places. The course is organized around regional themes and students will study all major regions of the world.
(3 contact hours)

**GEOG 1700 Map Design and Interpretation**                                                     **(TAG) 3 Credits**
This course provides an introduction to map interpretation and analysis, including earth coordinate systems, map projections, scale, topographic mapping, thematic mapping, spatial analysis methods, and mapping accuracy and error assessment. Students will learn and apply fundamental geographic information systems functions to the interpretation and analysis of maps.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 1740 Uncrewed Aircraft Systems (UAS)**                                                        **3 Credits**
This course provides an introduction to the principles, regulations, and application of uncrewed aircraft systems(UAS)and FAA guidelines for the operation of UAS. Topics include drone types and their use in the geospatial industry, applications, weather, safety risk management, crew resource management, careers that use UAS, and FAA regulations relevant to prepare for the FAA Part
(3 contact hours: 1 lecture, 2 lab)

**GEOG 1750 Introduction to Geospatial Intelligence**                                                **3 Credits**
This course addresses the fundamentals of geospatial intelligence, including the use of data, U.S. agencies and programs, military geography and its importance for geospatial intelligence, and the application of geospatial intelligence outside of military and intelligence agencies. The course provides an overview of geospatial intelligence and explores the linkage among cultural and physical geography, intelligence activities, and military operations. Students will become familiar with how U.S. intelligence and security agencies gather information, develop analytical products, and advise the U.S. national security policy makers.
(3 contact hours)

**GEOG 1800 Geography of US and Canada**                                                 **(OT36, TM) 3 Credits**
This course examines the environmental, cultural, social, geopolitical, and economic processes that characterize North America. Students will study regions and places within the US and Canada from a spatial viewpoint that emphasizes location, distribution, and relationships between society and environment.
(3 contact hours)

**GEOG 2700 Geographic Information Science** (TM) **3 Credits**
*Prerequisite: GEOG 1700, ITIS 1005 or permission of instructor or department chair.*
This course introduces students to the theory and practice of geographic information science through computer-based processing tools, including geographic information systems (GIS). Students will study fundamentals of GIS components, spatial data models, integration of coordinate systems, digital data sources, spatial database functions, terrain analysis, spatial analysis, thematic mapping, and data quality. Applications include land use planning, landform assessment, environmental management, site analysis, and demographic mapping.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 2710 Spatial Data Acquisition and Management** **3 Credits**
*Prerequisite: GEOG 2700 or permission of instructor or department chair.*
This course addresses the creation of spatial data, integration of spatial data into databases, and spatial database management. Topics include data collection with Global Positioning Systems (GPS), geodatabase design, integration of digital imagery, accuracy evaluation, use of coordinate systems, data standardization, and documentation of metadata.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 2720 Web Mapping and Programming for GIS** **1 Credit**
*Prerequisite: GEOG 2710 or permission of instructor or department chair.*
This course is designed to address the application, development, and data security process for web-based GIS deployment. Core components will cover securing data, programming, and web applications interfaces for disseminating geospatial information.
(1.5 contact hours: 0.5 lecture, 1 lab)

**GEOG 2730 Remote Sensing** **3 Credits**
*Prerequisite: GEOG 1700 or permission of instructor or department chair.*
This course provides an introduction to remote sensing and digital photogrammetry, with an emphasis on orthoimagery and LIDAR imagery and their use in geospatial technology. Topics include identification of types of remotely sensed imagery, electromagnetic spectrum, sensor types, resolution, image classification, georeferencing, and digital photogrammetric functions, including image processing, resampling, compression, and measurements.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 2740 sUAS Flight and Planning** **3 Credits**
*Prerequisite: GEOG 1740, GEOG 1700.*
This course introduces students to the theory and practice of small unmanned aircraft systems (sUAS) and application in geospatial technologies through flight collection and computer-based processing tools, including sUAS and geographic information systems. Students will study the fundamentals of sUAS components, flight planning, regulations, flight operations, equipment selection, weather conditions, flight management, data collection, data processing, quality controls for data, flight records, and incident reporting. Applications include emergency response, agricultural management, site analysis, volume measurement, and structural assessment.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 2750 Spatial Analysis and Modeling** **3 Credits**
*Prerequisite: GEOG 2700 or permission of instructor or department chair.*
This course addresses spatial applications and modeling in GIS. Students will gain experience in the use of buffering, overlay, spatial operators, Boolean search operators, programming, surface modeling, address matching, spatial modeling, and network and routing applications.
(4 contact hours: 2 lecture, 2 lab)

**GEOG 2780 Internship and Seminar in Geospatial Technology** **2 Credits**
*Prerequisite: GEOG 2700 or permission of instructor or department chair.*
Students will work for 100 hours under the direction of a qualified professional in geospatial technology. Students will work in a private or public agency with a focus on geospatial technology functions, including data acquisition, management, report and map making, or other geospatial tasks. The classroom seminar provides students with an overview of procedural, professional, and ethical issues faced by a geospatial technician on the job. Students will prepare a summary project for presentation to the class. Students may take this course up to two times for credit.
(8 contact hours: 1 lecture, 7 clinical)

**GEOG 2781 Internship and Seminar in sUAS Applications in Geospatial Technologies** **2 Credits**
*Prerequisite: GEOG 1740, GEOG 2740 or FAA Remote Pilot 107 certification.*
Students will work for 100 hours under the direction of a qualified professional in small unmanned aircraft systems (sUAS) geospatial applications. Students will work in a private or public agency with a focus on sUAS functions. The seminar provides students with an overview of procedural, professional, and ethical issues faced by sUAS practitioners on the job. Students will prepare a summary project for presentation to the class. Students may take this course up to two times for credit.
(8 contact hours: 1 lecture, 7 lab)