Geographic Information Systems Undergraduate Certificate

The Undergraduate Certificate in Geographic Information Systems introduces students to broad concepts, technologies, tools, and techniques related to the gathering and sharing of geographic data across various disciplines. Students will learn how to acquire geographic information from a variety of sources; manage, interpret, and present geospatial data for a given purpose; and how to use geographic information system (GIS) software for storage, manipulation, and analysis of geospatial data.

Core
SOC 2501 Introduction to Geographic Information Systems and Sciences 3
SOC 4501 Advanced Geographic Information Systems and Sciences 3
CMP SCI 3990 Undergraduate Internship 1

Electives
Choose one course from the following list of methods/visualization electives 3
GEOG 1001 Introduction to Geography (MOTR GEOG 101)
HONORS 2002 Topics in Information Literacy 2,3
SCMA 3331 Data Visualization for Business Applications 2
POL SCI 3350 Political Parties and Elections 2
CMP SCI 3411 Introduction to Data Visualization 2
SOC 3501 Social Mapping for Change
INFSYS 3830 Data Programming
CMP SCI 4420 Introduction to Digital Image Processing and Computer Vision 2

Choose one course from the following list of broadening electives 3
GEOG 1002 World Regions (MOTR GEOG 101)
GEOG 2001 Cultural Geography
HONORS 2020 Inquiries in the Fine and Performing Arts 3
HONORS 2040 Inquiries in Mathematics and Computing 2,3
POL SCI 2600 The Geography of Governance 2
HIST 4142 Inquiries in U.S. History 2,3
ECON 4160 Geospatial Analysis in the Social Sciences 2
CMP SCI 4200 Python for Scientific Computing and Data Science 2
PHIL 4460 Topics in Logic 2,3
SOC WK 4755 Introduction to Poverty, Human Rights, and Social Justice 2
MGMT 5634 Sustainability Management 2

Total Hours 13

Other UMSL courses and courses from other UM campuses, through ICCS or other formats, may be included as electives with prior approval of the program coordinator.

1 Must be approved by the program coordinator
2 This course has departmental prerequisites, please consult an advisor for more information
3 Only specific section offerings (those with formalized GIS content) may count toward certificate and must be approved by program director

Learning Outcomes

Upon completion of the program, certificate earners will be able to:

• Explain the important role of the geospatial dimension in data analysis and presentation
• Apply foundational concepts and methods of acquisition, management, visualization, and analysis of geographic data and apply these skills to problems in various disciplines
• Use GIS tools and methods to create maps, images, and other media to communicate in a meaningful way to others
• Solve GIS focused problems independently and as a member of a team