

GIS TECHNOLOGY 1
COURSE CODE: 5361

COURSE DESCRIPTION: This course is designed to include fundamentals of Geographical Information Systems (GIS) and remote sensing concepts, project management strategies, and essential basic computer skills. Students will acquire a basic understanding of geographic terms and concepts necessary for the appropriate use of GIS, including concepts of spatial variables, scale, map projection, and map coordinate systems. Students will also be exposed to the history of GIS, how GIS fits into overall information management systems, and a variety of applications in which GIS can contribute to analysis and decision-making.

OBJECTIVE: Given the necessary equipment, supplies, and facilities, the student will be able to successfully complete all of the following core competencies for a course granting one unit of credit.

RECOMMENDED GRADE LEVEL: 10–12

COURSE CREDIT: 1 unit

PREREQUISITE: Algebra I, Geometry, and Integrated Business Applications I or GIS Technology teacher approval

COMPUTER REQUIREMENT: One computer per student

RECOMMENDED SOFTWARE: ARCVIEW© 9

RESOURCES:

www.mysctextbooks.com

A. SAFETY AND ETHICS

1. Identify major causes of work-related accidents in offices.
2. Describe the threats to a computer network, methods of avoiding attacks, and options in dealing with virus attacks.
3. Identify potential abuse and unethical uses of computers and networks.
4. Explain the consequences of illegal, social, and unethical uses of information technologies, e.g., piracy; illegal downloading; licensing infringement; and inappropriate uses of software, hardware, and mobile devices.
5. Differentiate between freeware, shareware, and public domain software copyrights.
6. Discuss computer crimes, terms of use, and legal issues such as copyright laws, fair use laws, and ethics pertaining to scanned and downloaded clip art images, photographs, documents, video, recorded sounds and music, trademarks, and other elements for use in Web publications.

7. Identify netiquette including the use of email, social networking, blogs, texting, and chatting.
8. Describe ethical and legal practices in business professions such as safeguarding the confidentiality of business-related information.
9. Discuss the importance of cyber safety and the impact of cyber bullying.

B. EMPLOYABILITY SKILLS

1. Identify positive work practices, e.g., appropriate dress code for the workplace, personal grooming, punctuality, time management, and organization.
2. Demonstrate positive interpersonal skills, e.g., communication, respect, and teamwork.

C. STUDENT ORGANIZATIONS

1. Explain how related student organizations are integral parts of career and technology education courses.
2. Explain the goals and objectives of related student organizations.
3. List opportunities available to students through participation in related student organization conferences/competitions, community service, philanthropy, and other activities.
4. Explain how participation in career and technology education student organizations can promote lifelong responsibility for community service and professional development.

D. UNDERSTAND THE HISTORY, SOCIETAL IMPLICATIONS, UNDERLYING THEORIES, AND INDUSTRY APPLICATIONS OF GIS TECHNOLOGY

1. Discuss the history and societal implications of mapping, GIS, and remote sensing.
2. Describe the underlying theories of GIS and remote sensing technologies.
3. Identify industry applications for GIS technology.

E. UNDERSTAND MAP TYPES, PURPOSES, AND INFORMATION THEY DEPICT

1. Compare and contrast various forms of maps in terms of purpose, information, and application.
2. Convert latitude and longitude information between DMS and DD forms.
3. Identify sources of GIS information and their applicability to GIS projects.
4. Demonstrate how to read a topographical map.

F. DEMONSTRATE AN UNDERSTANDING OF COORDINATE SYSTEMS, PROJECTIONS, SCALE, MULTI-SPECTRAL IMAGERY, AND OTHER CONCEPTS INTEGRAL TO GEOGRAPHIC INFORMATION SYSTEMS

1. Identify terminology associated with map coordinate systems and location
2. Interpret location using the Geographic Coordinate System to identify absolute location
3. Identify terminology associated with maps, map scale, map projections, and orienteering
4. Explain the Universal Transverse Mercator (UTM) coordinate system
5. Interpret locations using the UTM coordinate system
6. Demonstrate an understanding of how maps are created using aerial photography.

G. CREATE, CHANGE, AND MANIPULATE DATA USED TO CREATE A MAP

1. Identify the primary components of the GIS Project Management Model.
2. Utilize a GPS unit to collect waypoints, measure distance, and calculate area.
3. Create and customize a localized satellite map scenario using an appropriate GIS software application.
4. Demonstrate the use of zooming, identifying, bookmarks, selecting, and panning tools.
5. Explain the components of the map display and the tools in the tool bars of common mapping software.
6. Explain the need for and uses of metadata.
7. Demonstrate geocoding addresses, heads-up digitizing, editing symbols, clipping data layers, and creating buffers.
8. Demonstrate various styles of displaying symbols of data, sorting querying, and selection techniques.
9. Demonstrate editing feature data.
10. Explain spatial reference.
11. Demonstrate how to georeference an Image Data Layer and add Control Points.

H. LAYOUT AND PRINT MAPS

1. Demonstrate the ability to define page margins and parameters for printing a specific size.
2. Demonstrate effective use of map elements that must be included in a map including title, author, data, legend, scale bar, north arrow.
3. Demonstrate effective use of page space through map scale and frame size.
4. Demonstrate process of creating digital archives of maps utilizing the export command.

I. DESIGN AN INDIVIDUAL CAREER PLAN THAT REFLECTS THE TRANSITION FROM SCHOOL TO WORK, LIFELONG LEARNING, AND PERSONAL AND PROFESSIONAL GOALS

1. Research, compare, and contrast GIS technology careers (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of GIS technology careers, the need for GIS technology workers, etc.).
2. Describe the variety of occupations and professions within the world of GIS technology including those where information technology is either in a primary focus or in a supportive role.
3. Describe job requirements for the variety of occupations and professions within the global world of GIS technology.
4. Analyze personal skills and aptitudes in comparison with GIS technology career opportunities.
5. Refine and implement a plan to facilitate personal growth and skill development related to GIS technology career opportunities.
6. Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

Reviewed February 2010

August 2009