

# Computer Mapping with GIS 2

## COURSE OUTLINE - UC

### **DESCRIPTION:**

Computer Mapping with GIS 2 is the capstone course in the Information Support and Services pathway. It is designed to prepare students for an entry-level position in the Geographic Information Systems (GIS) field and post-secondary education in Information Support and Services. It provides in-depth applications of GIS and computer mapping to geography, government, and business disciplines with emphasis on collaborative project management approach to resolving GIS issues. Specific topics include advanced spatial analysis (map overlays, buffers, networks), advanced GIS applications and software, 2D and 3D modeling, and analyzing the world with drone technology. Application of GIS advanced concepts will be reinforced in the laboratory with hands-on experience in the use of maps, data structures, spatial data, data integration and GIS outputs including charts, graphs, maps, and presentations. This advanced course will equip students with computer mapping, critical thinking, project collaboration skills, as well as scientific research and analytical skills used by GIS professionals in addressing emergency response, environmental, governmental and industry issues. Activities in this course include work-based learning that connects students to industry and the local community.

### **INFORMATION:**

PRE-REQUISITE: Computer Mapping with GIS 1

LENGTH: One Year

SECTOR: Information and Communications Technology

PATHWAY: Information Support and Services

ARTICULATED: No

UC A-G APPROVAL: Yes: College-Preparatory Elective (G) – History / Social Science Requirement

### **O\*NET SOC CODES:**

15-1441.00 Database Administrator

15-1199.05 GIS Technicians

17-3031.02 Mapping Technicians

<b>Orientation</b>
<ul style="list-style-type: none"> <li>A. Introduce the course and facilities.</li> <li>B. Discuss the syllabus and major objectives.</li> <li>C. Explain applicable classroom management procedures, the ROP Student Rules of Conduct, and any operational guidelines.</li> <li>D. Review instructor/student expectations.</li> <li>E. Explain enrollment and attendance requirements and procedures.</li> <li>F. Review grading and student evaluation procedures.</li> <li>G. Discuss the community classroom aspect of the program if applicable.</li> <li>H. Discuss the “next steps” related to additional education, training, and employment.</li> <li>I. Review classroom safety, emergency and disaster procedures.</li> </ul>
<b>1. Communication Skills</b>
<ul style="list-style-type: none"> <li>A. Demonstrate positive verbal communication skills using appropriate vocabulary, demeanor, and vocal tone in the classroom and/or worksite.</li> <li>B. Read and interpret written information and directions.</li> <li>C. Practice various forms of written communication appropriate to the occupation.</li> <li>D. Practice positive body language skills.</li> <li>E. Practice professional verbal skills for resolving a conflict.</li> <li>F. Demonstrate active listening skills including techniques for checking for understanding, and for obtaining clarification of directions.</li> </ul>
<b>2. Interpersonal Skills</b>
<ul style="list-style-type: none"> <li>A. Demonstrate positive teamwork skills by contributing to a group effort.</li> <li>B. Practice the importance of diversity awareness and sensitivity in the workplace.</li> <li>C. Define sexual harassment in the workplace and identify the employee’s role and responsibility.</li> <li>D. Practice participation skills.</li> <li>E. Identify different personality types and strategies for working effectively with each type.</li> <li>F. Practice business and social etiquette skills appropriate to the occupation.</li> <li>G. Discuss the role of business and personal ethics in the decision-making process.</li> <li>H. Evaluate various job-related scenarios and justify decisions based on ethics.</li> <li>I. Demonstrate flexibility and adaptability in working with others.</li> <li>J. Demonstrate the use of time management skills.</li> </ul>
<b>3. Employability Skills</b>

- A. Demonstrate appropriate attendance and punctuality practices for the classroom and worksite if applicable.
- B. Prepare a resume, cover letter, and job application forms.
- C. Demonstrate interviewing techniques using appropriate tone and body language.
- D. Demonstrate appropriate dress and grooming standards in seeking employment and for the workplace.
- E. Identify strategies for employment retention.
- F. Analyze the impact of social networking on employability.
- G. Identify the need for continuing education, professional development, and professional growth in chosen field.
- H. Identify appropriate procedures for leaving a job.
- I. Identify sources of job information, including electronic sources.
- J. Review company policies and current trends in employee compatibility screening, drug screening, and background checks.

#### 4. Leadership

- A. Define leadership and identify the responsibilities, competencies, and behaviors of successful leaders.
- B. Work with peers to promote divergent and creative perspectives.
- C. Demonstrate how to organize and structure work, individually and in teams, for effective performance and the attainment of goals.
- D. Explain multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace.
- E. Employ ethical behaviors and actions that positively influence others.
- F. Use a variety of means to positively impact the direction and actions of a team or organization.
- G. Analyze the short-term and long-term effects a leader's actions and attitudes can have on productivity, morale, and organizational culture.

#### 5. Personal and Occupational Safety

- A. Demonstrate procedures to be followed in the case of emergencies.
- B. Discuss ways to report a potential safety hazard to a supervisor.
- C. Identify and discuss cyber ethics, cyber safety, and cyber security.
- D. Apply personal safety practices to and from the job.
- E. Describe the procedure for reporting a work-related hazard or injury.
- F. Recognize the effects of substance abuse in the workplace.
- G. Recognize good housekeeping as a safety issue.
- H. Identify safety hazards commonly found in the workplace environment.
- I. Describe the procedures for reporting a work-related injury.
- J. Explain the importance of CAL-OSHA.
- K. Define and discuss ergonomics in relation to the working environment.
- L. Discuss the electrical hazards of working with electronic equipment.

<b>6. Advanced Project Management &amp; Presentation Skills</b>
<ul style="list-style-type: none"><li>A. Apply principles of project management.</li><li>B. Develop a resource assessment plan and discuss contingencies for inadequate resources during a project.</li><li>C. Define risks and discuss ways of reducing risks to project completion.</li><li>D. Monitor project through various tools such as project management apps, team meetings, data analysis, and reports.</li><li>E. Evaluate Key Performance Indicators (KPIs) to ensure task objectives are being met (quality assurance).</li><li>F. Analyze project for lessons learned and identify improvements for future projects.</li><li>G. Identify the audience and stakeholders requesting the GIS project.</li><li>H. Create maps, dashboard, and reports that are appropriate and relevant to the audience and stakeholders.</li><li>I. Organize presentation of the project to meet the objectives and needs of the audience.</li><li>J. Communicate in a clear and persuasive manner with the aid of various presentation software.</li><li>K. Update projects to electronic portfolio.</li></ul>
<b>7. Advanced Coordinate System</b>
<ul style="list-style-type: none"><li>A. Explore the appropriate projection system to use in GIS.</li><li>B. Apply the use of advanced coordinate systems and mapping in GIS.</li><li>C. Evaluate advanced geographic concepts of projection and datum.</li><li>D. Produce advanced maps using the correct map coordinate system and map scales.</li></ul>
<b>8. Advanced Spatial Analysis</b>
<ul style="list-style-type: none"><li>A. Evaluate the spatial analysis process.</li><li>B. Overlay and produce maps combining GIS data structures.</li><li>C. Identify challenges of gaining access to spatial data.</li><li>D. Define containment, proximity, adjacency, terrain analysis, buffers and networks.</li><li>E. Use spatial data to set map projections.</li><li>F. Apply GIS to a spatial problem.</li><li>G. Integrate spatial data into shapefile.</li></ul>
<b>9. Advanced GIS Applications</b>
<ul style="list-style-type: none"><li>A. Create Python scripts to create modeling.</li><li>B. Configure ArcGIS Server and use it to host GIS Applications.</li></ul>

- C. Build and publish Web AppStudio Applications.
- D. Develops web applications with AppBuilder.
- E. Host Web AppBuilder Applications on ArcGIS Server.

**10. 2D and 3D Modeling**

- A. Compare and contrast the roles of 2D and 3D modeling in GIS.
- B. Describe the advantages and disadvantages of 2D and 3D models in GIS.
- C. Describe parts of a 3D model including vertices, lines, polygons, unwrapping, texture, and bones.
- D. Create 2D and 3D models.
- E. Use 3D models and data visualizations to see patterns, trends and non-obvious relationships.
- F. Spatial temporal modeling.

**11. Analyze the World with Drone Technology**

- A. Describe Drone Mapping.
- B. Describe the role of gravity in drone mapping.
- C. Define the image, ground, and output controls of the coordinate systems.
- D. Explain the impact of incorrect specifications for drone mapping.
- E. Review Drone2Map for ArcGIS software and workflow.
- F. Convert still imagery to Ortho mapping and 3D modeling.
- G. Explain collection of data.
- H. Address public privacy rights, legal and ethical issues.
- I. Discuss the requirements for drone piloting.

**12. GIS in an Organization**

- A. Identify how applications of GIS can be used in decision-making and strategic planning.
- B. Describe the costs and benefits expected from the use of GIS for a specific application.
- C. Describe the planning process of implementing a GIS within an organization.
- D. Develop a GIS needs assessment and its uses in an organization.
- E. Identify potential legal issues associated with GIS in an organization.

**13. US Census data, demographics and population growth**

- A. Describe difficulties encountered by government when using GIS.
- B. List modern GIS solutions to government agency difficulties.

- C. Describe history and purpose of the United States census.
- D. Analyze shifting demographics and population.
- E. Explore demographics and its relationship to population growth.
- F. Evaluate demographic and geospatial data from the US Census Bureau
- G. Download appropriate Census Tiger files to curate data.
- H. Recognize spatial patterns between data variables.
- I. Access data.census.gov and ACS (American Community Survey) data set.
- J. Compare and contrast differences between government issued data and public issued data.

## 14. GIS for Global Government

- A. Explore changing national political boundaries from maps and data.
- B. Examine the relationship of national politics to international cohesiveness and economics.
- C. Evaluate the extent to which events in a specific country can have global consequences.
- D. Research the effectiveness of international organizations whose members share political boundaries.
- E. Examine ongoing events of social, economic, and environmental justices and racism.

## 15. GIS for Private Businesses

- A. Describes various GIS uses and challenges encountered by businesses.
- B. Define GIS solutions to challenges encountered by private businesses.
- C. Incorporate GIS into creating a marketing strategy.
- D. Identify GIS factors for selecting retail sites.

## 16. GIS for Earthquakes and Tectonic Plates

- A. Define geographic terminology pertaining to earthquakes and plate tectonic plates.
- B. Explore USGS website to understand the use of GIS by seismologists in predicting earthquakes.
- C. Access current earthquake data from the USGS.
- D. Identify the relationships between plate boundaries and physical features using advanced spatial analysis.
- E. Produce and analyze a map with recent seismic activities.
- F. Use spatial queries to identify high risk earthquake areas and predict earthquakes.

## 17. Emergency Response for Wildfires

- A. Discuss the purpose of emergency management and the role of FEMA agency.

- B. Use a visual map to communicate wildfire risk and hazards to the community and public safety agencies.
- C. Examine data for current and historic GIS information required for wildlife mitigating and planning.
- D. Analyze spatial relationships and patterns for wildfires including wildfires.
- E. Demonstrate the use of GIS solutions in emergency response scenarios.
- F. Identify property damage and other impacts after an incident or event.
- G. Use GIS and data-driven decisions to deploy resources for wildfires.
- H. Describe the use of social media (Facebook, Twitter, Instagram) in gathering and displaying spatial data during an emergency. (See social media map on ESRI's website for Hurricane Sandy in 2012.)

## 18. GIS for Transportation

- A. List the various ways for transporting people and goods.
- B. Discuss the potential use of drones in distribution of goods.
- C. Examine the hazards involved in logistics and transportation of goods.
- D. Explore the use of GIS in creating efficiencies in delivery and operations of an organization and transporting people.

## 19. Final Project: Independent Study Map and Report

- A. Select an independent study project that reflects Computer Mapping with GIS I and II course contents.
- B. Apply the geographic inquiry process.
- C. Apply geographic research techniques, cartographic design principles and spatial analysis skills.
- D. Create a relevant Story Map / map that demonstrates proficient GIS research and mapping skills.
- E. Apply analytical decision-making skills that results in recommendations supported by data.

## 20. Career Development

- A. Update resume and cover letter.
- B. Practice communication and interview skills.
- C. Demonstrate leadership skills and professionalism.
- D. Explore GIS job entry requirements.
- E. Update portfolio with projects.
- F. User Groups and Social Media profiles.

## 21. Portfolio Design

- A. Develop personal marketing and computer skills by refining your digital portfolio for post-secondary and employment acceptance.
- B. Compile best samples of original works and documents for a variety of purposes, which shows a progression in the acquisition of knowledge and/or skills.

- C. Demonstrate knowledge of competencies through journaling or summary of selected works or documents.
- D. Revise professional resume and cover letter to align with skills and objective statements of the relevant industry.
- E. Dress professionally and practice interviewing techniques using portfolio materials.
- F. Assemble industry and employability documents (resume, cover letter, certifications, recommendation letters, etc.).
- G. Create a "leave behind" book or folder.
- H. Display portfolio materials during a fair, community event, competition, or professional panel review.
- I. Evaluate and utilize feedback to improve portfolio.



**Key Assignments**

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
1. Students will participate in mock interviews that represent current industry practices (e.g., skills demonstrations, resumes, applications, portfolios, personal websites, etc.).	1A, B, D 3B, C, D, I, J 20A-E 21 A-1	2 3 10	2 3		LS 11-12.6 SLS 11-12.2
2. Students will debate the issue of drone use in relation to privacy, ownership, and copyright of data and possible impact on the industry.	1A – F 2J 11G, H	1 2 4 5 9 10 11 12	2 4 5 8 10	A1.0 A5.0	LS 11-12.1 LS 11-12.2 LS 11-12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d WS 11-12.6 - 12.9
3. Students will work with map layers (consisting of geographic or spatial features) and underlying attribute data tables for U.S. states, cities, counties, and streets.	1A, B, D 2A, D, E, F, I, J 6A – H 7A-I 8F, G 11 A-E 12 A-F 13 A-H 15C	1 2 4 5 9 10 12	2 4 5 8 9 10	A2.0 A3.0 A4.0 A8.0	LS 11-12.3 LS 11-12.6 WS 11-12.6
4. Given a scenario based on current events, students will work with demographic and geospatial data from the US Census Bureau (data.census.gov), ACS (American Community Survey) and Tiger files. Students will identify spatial patterns using data variables such as income, education, ethnicity, home ownership, etc. Students will evaluate trends to make predictions and present findings to class using presentation software. Students will use	1A, B, D 2A, D, E, F, I, J 6A – H 7A-I 8F, G 11 A-E	1 2 4 5 9 10	2 4 5 8 9 10	A2.0 A3.0 A8.0	LS 11-12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WS 11-12.6

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
project management skills and collaboration skills to manage the process.	12 A-F 13 A-H 15C	12			SEP 4, SEP 7
5. Students will create a dashboard app to collect data – Students will collect data from different online and community sources and use information to create a dashboard app. Students will use spatial analysis to resolve a current issue pertaining to the community, propose a plan of action and make recommendations to the city council supported by maps and relevant data. Students will use project management skills and collaboration skills to manage the process.	1A, B, D 2A, D, E, F, I, J 6A – H 7A-I 8F, G 11 A-E 12 A-F 13 A-H 15C	1 2 4 5 9 10 12	2 4 5 8 9 10	A2.0 A3.0 A6.0 A8.0	LS 11-12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WS 11-12.6 SEP 4, SEP 7
6. Students will create a map that identifies the social, economic and technical implications of rapid population growth. Students will use the identified data to write a 2-page essay on the social and environmental implications of population growth and regions of the world which will be most affected.	1A – F 2J 6B, E, F 9A -C, E, F, H 11C -E, H, I, J 13A, F, G, H	1 2 4 5 9 10 11 12	2 4 5 8 10	A2.0 A3.0 A4.0	LS 11-12.1 LS 11-12.2 LS 11-12.3 LS 11-12.6 WS 11-12.4 WS 11-12.6 SEP 4
7. Utilizing current USGS earthquake and volcanic data, students will create multiple maps showing areas of increased earthquake activity and multiple maps identifying “hot spots” along plate boundaries of increased volcanic activity. Students will investigate the relationship between earthquakes, volcanoes, tectonic plates and physical features using spatial data.	1A, B, D 2A, D, E, F, I, J 6A – F 11A-F	1 2 4 5 9 10 11 12	2 4 5 8 9 10	A2.0 A3.0 A4.0	LS 11-12.1 LS 11-12.2 LS 11-12.3 LS 11-12.6 WS 11-12.3 WS 11-12.4 WS 11-12.6 SEP 3

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
8. Students will analyze earthquake patterns in a California city using historical data. Students will use spatial analysis of determined patterns to predict future earthquake risks and present findings to class. Students will use the identified data to write a 2-page essay on the implications of population growth and regions of the world which will be most affected. Students will document and present findings.	1A, B, D 2A, D, E, F, I, J 6A – F 11A-F	1 2 4 5 9 10 11 12	2 4 5 8 9 10	A1.0 A2.0 A3.0 A6.0 A8.0	LS 11-12.1 – 12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WHSST 11-12.2 WS 11-12.4 WS 11-12.6 – 12.8 US 11.8.7
9. Students will be given a specific hurricane or tsunami to analyze. Students will create a geographic map of an area before the hurricane or tsunami to include population, towns or cities, land use, climate, industries etc. Students will provide dates, locations, weather conditions, path, size, and amount of destruction that resulted from the hurricane or tsunami in order to gain multiple layers of data for decision-making, action plan, tracking, predicting of hurricanes or tsunamis and its damage. Using this data, students will write a 2-page report documenting findings on how this hurricane or tsunami and the resulting damage could have been predicted. Students will present their findings supported by the relevant map. Students will use project management, presentation and collaboration skills to manage the process.	1A, B, D 2A, D, E, F, I, J 6A – F 11A-F	1 2 4 5 9 10 11 12	2 4 5 8 9 10	A1.0 A2.0 A3.0 A4.0 A8.0	LS 11-12.1 - 11-12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WS 11-12.3 – 12.4 WS 11-12.6 – 12.7 SEP 3, SEP 4, SEP 7
10. In groups, students will argue for or against the use of social media as a reliable or unreliable source during emergencies. Students will study a social media map on ESRI website (Hurricane Sandy in 2012) to help them determine the validity or viability of using social media for disaster planning.	1A, B, D 2A, D, E, F, I, J 6A – F 11A-F	1 2 4 5 9 10 11 12	2 4 5 8 9 10	A2.0 A3.0 A4.0 A8.0	LS 11-12.1 LS 11-12.2 LS 11-12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d WS 11-12.6 - 12.9

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
11. Given a scenario based on current events, students will use spatial analysis to evaluate geographic hypotheses and develop cartographic recommendations based on their findings. Students will use project management and collaboration skills to manage the process. Based on the identified data, students will write a 2-page report and present findings to class using a preferred presentation software and upload project to portfolio.	1A – F 2A, D, E, I, J 10C -G 11A -J 13A – I	1 2 4 5 9 10 11 12	2 4 5 9 10	A3.0 A4.0 A7.0 A8.0	LS 11.12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WS 11-12.3 WS 11-12.3 - 12.4 WS 11-12.6 - 12.7
12. Given a scenario based on current events, students will obtain and analyze relevant data, build data tables and shapefiles, then present their data in the appropriate digital map.	1A – F 2J 6E 10D -G 11C, E, F, H 12A, G 13B, 13D -H	1 2 4 5 9 10 11 12	2 4 5 8 10	A2.0 A3.0 A8.0	LS 11.12.3 LS 11-12.6 WS 11-12.6 SEP 3, SEP 4
13. Using advanced project management skills, teams of students will research, import, and manipulate online data resources to produce a map for a specified scenario. Students will present findings in class.	1A – F 2A, D, E, F, I, J 6 A, B 15A - F 10 A-C, E - F	1 2 4 5 9 10 11 12	2 4 5 8 9 10	A1.0 A2.0 A3.0 A4.0 A8.0	LS 11-12.1 - 12.3 LS 11-12.6 SLS 11-12.1 SLS 11-12.1d SLS 11-12.2 WS 11-12.3 - 12.4 WS 11-12.6 - 12.7 SEP 3, SEP 4
14. Students will select an independent study project to be approved by instructor. Using research skills and the geographic inquiry process, students will submit a 5-6 page research report and a supporting GIS map.	1A – F 2J 6B, E, F 9A -C, E, F, H	1 2 4 5	2 4 5 8	A1.0 A2.0 A3.0 A4.0	LS 11-12.1 - 12.3 LS 11-12.6 WS 11-12.3 - 12.4 WS 11-12.6 - 12.7

Assignment	Competencies	Career Ready Practices	Anchor Standards	Pathway Standards	CCSS
	11C -E, H, I, J 13A, F, G, H	9 10 11 12	10	A8.0	SEP 1, SEP 4

## Standards Assessed in this Program

### Career Ready Practices

1. Apply appropriate technical skills and academic knowledge.
2. Communicate clearly, effectively, and with reason.
3. Develop an education and career plan aligned to personal goals.
4. Apply technology to enhance productivity.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
7. Act as a responsible citizen in the workplace and the community.
8. Model integrity, ethical leadership, and effective management.
9. Work productively in teams while integrating cultural/global competence.
10. Demonstrate creativity and innovation.
11. Employ valid and reliable research strategies.
12. Understand the environmental, social, and economic impacts of decisions.

### Anchor Standards

#### 2.0 Communications

- Acquire and use accurately sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

#### 3.0 Career Planning and Management

- Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

#### 4.0 Technology

- Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the sector workplace environment.

#### 5.0 Problem Solving and Critical Thinking

- Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

#### 6.0 Health and Safety

- Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the sector workplace environment.

#### 7.0 Responsibility and Flexibility

- Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the sector workplace environment and community settings.

#### 8.0 Ethics and Legal Responsibilities

- Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

## 9.0 Leadership and Teamwork

- Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.

## 10.0 Technical Knowledge and Skills

- Apply essential technical knowledge and skills common to all pathways in the sector following procedures when carrying out experiments or performing technical tasks.

## Pathway Standards

### Information Support and Services Pathway

**A1.0** Describe the role of information and communication technologies in organizations.

**A2.0** Acquire, install, and implement software and systems.

**A3.0** Access and transmit information in a networked environment.

**A4.0** Administer and maintain software and systems.

**A5.0** Identify requirements for maintaining secure network systems.

**A6.0** Diagnose and solve software, hardware, networking, and security problems.

**A7.0** Support and train users on various software, hardware, and network systems.

**A8.0** Manage and implement information, technology, and communication projects.

## Common Core State Standards

### ENGLISH LANGUAGE ARTS

#### Language Standards

**LS 11-12.1:** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

**LS 11-12.2:** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

**LS 11-12.3:** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

**LS 11-12.6:** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the (career and college) readiness level, demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

#### Speaking and Listening Standards

**SLS 11-12.2:** Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions, and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

**SLS 11-12.1:** Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others ideas and expressing their own clearly and persuasively.

**SLS 11-12.1d:** Respond thoughtfully to diverse perspectives, synthesize comments, claims and evidence made on all sides of an issue, resolve contradictions when possible, and determine what additional information or research is required to deepen the investigation or complete the work.

## **Writing Standards**

**WS 11-12.3:** Write narratives to develop real or imaged experiences or events using effective technique, well-chosen details, and well-structured event sequences.

**WS 11-12.4:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

**WS 11-12.6:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback including new arguments and information.

**WS 11-12.7:** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

## **HISTORY/ SOCIAL SCIENCE**

### **US History and Geography**

**US 11.8.7:** Describe the effects on society and the economy of technological developments since 1945, including the computer revolution, changes in communication, advances in medicine, and improvements in agricultural technology.