

## Master Syllabus Programming for Geographic Information Systems (GIS) GISC 2435

All GIS instructors teaching this course are expected to include the following items in their course syllabus. The order that they are included is up to each instructor, and instructors may include additional items. All underlined text below must be included in every instructor's syllabus exactly as stated. *It is up to each instructor to compose those parts of the master syllabus below that are in italicized print.* Your individual policies are up to you, but you must include clearly stated policies as required below.

### 1. Section Specific Information

*The instructor will give the following information to students:*

- a. *Course name and number:* Programming in Geographic Information Systems (GIS) GISC 2435
  - b. *Section number and synonym*
  - c. *Campus, room, and time of day*
- ### 2. Instructor Information
- a. *Instructor's name*
  - b. *Office hours*
  - c. *Office location and number*
  - d. *Phone, email, website, etc.*
  - e. *Arranging conference/appointments*
  - f. *other avenues for contacting the professor; as appropriate (through BlackBoard, e.g.)*
- ### 4. Course Description
- a. *Credit Hours: 4*  
*Classroom Contact Hours per week: 3*  
*Laboratory Contact Hours per week: 3*
  - b. Catalog Description: This course focuses on the use of programming languages to customize and expand the capability of GIS applications. Instruction will include object-oriented and component programming. Students will also design their own Graphical User Interface (GUI). Students will automate tasks and geospatial processes using Python programming language. Students learn fundamental programming principles and how to apply them in a GIS. Exercises and projects use Python, ArcPy, and ArcGIS software.
  - c. Transferability of workforce courses varies. Students interested in transferring courses to another college should speak with their Area of Study (AoS) advisor, Department Chair, and/or Program Director.
- ### 5. Course Rationale/Objectives
- a. Programming for Geographic Information Systems (GIS) is designed to provide the students with an understanding of the methods and theories of programming for GIS that will allow students to apply GIS knowledge and skills to everyday

life and their chosen careers, and to apply the course towards a certificate or an associate's degree at Austin Community College (ACC).

6. Course Prerequisite(s)

- a. Introduction to GIS (GISC 1411 or GEOG 2470) and Intermediate GIS

7. Student Learning Outcomes

a. WECM Student Learning Outcomes

The Workforce Education Course Manual (WECM) is a web-based inventory of current workforce education courses and outcomes published by the Texas Higher Education Coordinating Board for Texas public two-year colleges. WECM courses are created and maintained by teams of instructional specialists from Texas college with expertise in the subject areas. By the end of this course, the student will be able to:

- Describe and understand basic programming for GIS applications
- Perform programming for GIS customizations

a. GTCM Student Learning Outcomes

The Geospatial Technology Competency Model (GTCM) is an industry model framework published by the US Department of Labor Employment and Training Administration (ETA) to identify industry-specific technical competencies. By the end of this course, the student will be able to:

- Identify appropriate software development tools for particular end uses
- Automate geospatial analysis methods such as transformations, raster analysis and geometric operations
- Use scripting languages such as Python and others to automate repetitive tasks in desktop geospatial software
- Recognize GIS tasks that are amenable to automation, such as route generation, incident response, and land use change analysis
- Identify alternatives for customization and automation, such as APIs, SDKs, scripting languages
- Discuss trends in geospatial technology and applications.

b. Additional Student Learning Outcomes

c. SCANS Competencies

The Secretary Commission on Achieving Necessary Skills (SCANS) is a commission appointed in 1990 by the Secretary of the US Department of Labor Lynn Martin to develop a list of skills "that high-performance workplaces require and that high-performance schools should produce." By the end of this course, the student will demonstrate the following workplace competencies and foundation skills:

- Workplace Competencies - Effective workers can productively use:
  1. Resources – They know how to allocate (C1) time, (C2) money, (C3), materials, and (C4) staff
  2. Information – They can (C5) acquire and evaluate data, (C6) organize and maintain files, (C7) interprets and communicate, and

- (C8) use computers to process information.
  - 3. Interpersonal skills – They can (C9) work on teams, (C10) teach others, (C11) serve customers, (C12) lead, (C13) negotiate, and (C14) work well with people from culturally diverse backgrounds.
  - 4. Systems – They (C15) understand social, organizational, and technological systems, (C16) they can monitor and correct performance; and (C17) they can design or improve systems.
  - 5. Technology – They can (C18) select equipment and tools, (C19) apply technology to specific tasks and (C20) maintain and troubleshoot equipment.
- Foundation Skills - Competent workers in the high-performance workplace need:
  - 1. Basic Skills – (F1) reading, (F2) writing, (F3) arithmetic and (F4) mathematics, (F5) listening and (F6) speaking.
  - 2. Thinking skills – (F7) to think creatively, (F8) to make decisions, (F9) to solve problems, (F10) to visualize, (F11) the ability to learn, and (F12) to reason.
  - 1. Personal Qualities – (F13) individual responsibility, (F14) self-esteem, (F15) sociability, (F16) self-management, and (F17) integrity.

8. Required Texts/Materials

- a. *List all texts/materials that students will need for the course. For each textbook include the title, author, edition, date published, publisher, and International Standard Book Number (ISBN) if available.*

9. Instructional Methodology

- a. *The instructor will describe the methodology (lecture, lecture/lab, laboratory clinical, co-op based, internship, practicum, online, hybrid, competency-based) that will be used to teach the course.*

10. Distance Education (for online and hybrid courses only)

- a. ACC distance education courses are every bit as academically challenging as on-campus courses, but many students discover that there are also unique challenges to online education. Common challenges that distance students encounter include lack of self-motivation, inability to focus, trouble maintaining accountability, being disorganized, inability to effectively communicate, poor time management, and failure to balance your educational and personal commitments.
- b. You must be able to manage your time effectively and prioritize your course workload in order to meet deadlines and stay on track with your coursework. Successful students are self-starters who understand the commitment and discipline required to thrive in an online environment. You must ask questions when you do not understand something. Contact your instructor right away; otherwise, there is no way for your instructor to know that something is wrong.
- c. Students will access the Blackboard learning management system to gain access

to lecture and lab materials and to read assignment instructions, submit assignments, and collaborate.

#### 11. Student Technology Support

- a. Austin Community College provides free, secure drive-up WiFi to students and employees in the parking lots of all campus locations. WiFi can be accessed seven days a week, 7 am to 11 pm. Additional details are available at <https://www.austincc.edu/sts>.
- b. Students who do not have the necessary technology to complete their ACC courses can request to borrow devices from Student Technology Services. Available devices include iPads, webcams, headsets, calculators, etc. Students must be registered for a credit course, Adult Education, or Continuing Education course to be eligible. For more information, including how to request a device, visit <http://www.austincc.edu/sts>.
- c. Student Technology Services offers phone, live-chat, and email-based technical support for students and can provide support on topics such as password resets, accessing or using Blackboard, access to technology, etc. To view hours of operation and ways to request support, visit <http://www.austincc.edu/sts>.

#### 12. Grading System

- a. *Although there are no discipline-wide policies regarding grading, the instructor will explain to students how they will be graded in this course.*

#### 13. Course Policies

- a. Attendance/Participation: *The instructor will explain to students their policy on attendance/participation relative to this course. Suggested wording - If there are specific policies for field or laboratory activities, they could be included here. Some suggested wording is: "Regular and punctual class and laboratory attendance is expected of all students. If attendance or compliance with other course policies is unsatisfactory, the instructor may withdraw students from the class."*

*Or for online courses: "Regular and timely class participation in discussions and completion of work is expected of all students. If attendance or compliance with other course policies is unsatisfactory, the instructor may withdraw students from the class."*

*And to cover situations where classes are cancelled because of weather, pandemic, or other emergencies: "The student is responsible for communicating with their professor during the closure and completing any assignments or other activities designated by their professor."*

- b. Withdrawal: *The instructor will explain to students their policy on withdrawal relative to this course. Suggested wording - "It is the responsibility of each*

*student to ensure that his or her name is removed from the rolls should they decide to withdraw from the class. The instructor does, however, reserve the right to drop a student should he or she feel it is necessary. If a student decides to withdraw, he or she should also verify that the withdrawal is recorded before the Final Withdrawal Date. The Final Withdrawal Date for this semester is [insert date here]. The student is also strongly encouraged to keep any paperwork in case a problem arises.*

- c. *Students are responsible for understanding the impact that withdrawal from a course may have on their financial aid, veterans' benefits, and international student status. Per state law, students enrolling for the first time in Fall 2007 or later at any public Texas college or university may not withdraw (receive a "W") from more than six courses during their undergraduate college education. Some exemptions for good cause could allow a student to withdraw from a course without having it count toward this limit. Students are strongly encouraged to meet with an advisor when making decisions about course selection, course loads, and course withdrawals."*
- d. Missed or Late Work: *The instructor will explain to students their policy on missed or late work relative to this course.*
- e. Incomplete: *The instructor will explain to students their policy on Incomplete course grades relative to this course. Recommended wording - "An incomplete (grade of "I") will only be given for extenuating circumstances. What constitutes "extenuating circumstances" is left to the instructor's discretion. If a grade of I is given, the remaining course work must be completed by a date set by the student and professor. This date may not be later than two weeks prior to the end of the following semester. A grade of I also requires completion and submission of the Incomplete Grade form, to be signed by the faculty member (and student if possible) and submitted to the department chair.*

*Students may request an Incomplete from their faculty member if they believe circumstances warrant. The faculty member will determine whether the Incomplete is appropriate to award or not. The following processes must be followed when awarding a student an I grade.*

1. *Prior to the end of the semester in which the "I" is to be awarded, the student must meet with the instructor to determine the assignments and exams that must be completed prior to the deadline date. This meeting can occur virtually or in person. The instructor should complete the Report of Incomplete Grade form.*
2. *The faculty member will complete the form, including all requirements to complete the course and the due date, sign (by typing in name) and then email it to the student. The student will then complete his/her section, sign (by typing in name), and return the completed form to the faculty member to complete the agreement. A copy of the fully completed form can then be emailed by the faculty member to the student and the department chair for*

*each grade of Incomplete that the faculty member submits at the end of the semester.*

3. *The student must complete all remaining work by the date specified on the form above. This date is determined by the instructor in collaboration with the student, but it may not be later than the final withdrawal deadline in the subsequent long semester.*
4. *Students will retain access to the course Blackboard page through the subsequent semester in order to submit work and complete the course. Students will be able to log on to Blackboard and have access to the course section materials, assignments, and grades from the course and semester in which the Incomplete was awarded.*
5. *When the student completes the required work by the Incomplete deadline, the instructor will submit an electronic Grade Change Form to change the student's performance grade from an "I" to the earned grade of A, B, C, D, or F.*

*If an Incomplete is not resolved by the deadline, the grade automatically converts to an "F." Approval to carry an Incomplete for longer than the following semester or session deadline is not frequently granted."*

### **College Policies**

Please refer to

<https://www.austincc.edu/offices/academic-outcomes-assessment/master-syllabi/college-policies> or the link in Blackboard for ACC's college policies including Statement on Academic Integrity, Student Rights & Responsibilities, Senate Bill 212 and Title IX Reporting Requirements, Student Complaints, Statement on Privacy, Recording Policy, Safety Statement, Campus Carry, Discrimination Prohibited, Use of ACC email, Use of the Testing Center, and Student Support Services.