

SYLLABUS

DATE OF LAST REVIEW:	3/9/2026
CIP CODE:	15.1302
SEMESTER:	Departmental Syllabus
COURSE TITLE:	Introduction to Global Positioning Systems
COURSE NUMBER:	ENGR0140
CREDIT HOURS:	4
INSTRUCTOR:	Departmental Syllabus
OFFICE LOCATION:	Departmental Syllabus
OFFICE HOURS:	Departmental Syllabus
TELEPHONE:	913-334-1100
EMAIL:	KCKCC-issued email accounts are the official means for electronically communicating with our students.
PREREQUISITE(S):	None

REQUIRED TEXT(S): Please check with the KCKCC bookstore, <http://www.kckccbookstore.com> for the required text for your particular class.

COURSE DESCRIPTION:

This course will provide the student with knowledge of the Global Positioning System. The student will learn how to use NAVSTAR GPS to locate precise positions on the globe; to plot a course and navigate using a handheld global positioning receiver. This course will show how civil drafting data may be collected on a gps receiver and input into the computer to generate plot plans.

METHOD OF INSTRUCTION:

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

Course content may vary, but will generally include the following:

- I. Concepts of Global Positioning Systems

- A. Global Positioning Systems and Geographic Information Systems
- B. Determining where we are
- C. Components of NAVSTAR
 - 1. The earth
 - 2. Satellites
 - 3. Ground based systems
 - 4. Global Positioning Receivers
 - 5. US Department of Defense
- II. Using a Global Positioning Receiver
 - A. GPS receiver fundamentals
 - B. Setting receiver parameters
 - C. Correlating GPS data with map data
- III. Automated Data Collection
 - A. Measuring distance by sound and time
 - B. Factors affecting data collection
 - C. Geometric dilution of precision
 - D. Planning a data collection set
 - E. Collecting data in the field
 - 1. Collecting data on foot
 - 2. Collecting data on a bicycle
 - 3. Collecting data in a motor vehicle
- IV. Correcting GPS Data
 - A. GPS accuracy
 - B. Differential correction
 - C. Correcting clock errors
 - D. Correcting receiver errors
 - E. Correcting Ephemeris (Satellite Position) errors
 - F. Correcting atmospheric errors
- V. ArcView, Arcdata, and GPS
 - A. Integrating GPS data into ArcView
 - B. Converting GPS trimble format into macro
 - C. Merging TIGER files with GPS data

EXPECTED LEARNER OUTCOMES:

- A. Upon completion of the course the student will be able to demonstrate knowledge of the Global Positioning System and its' components.
- B. Upon completion of the course the student will be able to use a handheld GPS receiver.
- C. Upon completion of the course the student will be able to collect data using a handheld GPS receiver.
- D. Upon completion of the course the student will be able to correct GPS data errors.
- E. Upon completion of the course the student will be able to integrate GPS data with GIS data.

COURSE COMPETENCIES:

Upon completion of the course the student will be able to demonstrate knowledge of the Global Positioning and its' components.

- 1. Upon completion of the course the student will be able to identify the components of the Global Positioning System.

2. Upon completion of the course the student will be able to define the relationship of the earth to the Global Positioning System.
3. Upon completion of the course the student will be able to define the relationship of satellites to the Global Positioning System.
4. Upon completion of the course the student will be able to define the relationship of GPS receivers to the Global Positioning System.
5. Upon completion of the course the student will be able to define the relationship of ground based stations to the Global Positioning System.
6. Upon completion of the course the student will be able to identify the number of satellites in the Global Positioning System.

Upon completion of the course the student will be able to use a handheld GPS receiver.

7. Upon completion of the course the student will be able to identify a precise position on the earth using a handheld GPS receiver.
8. Upon completion of the course the student will be able to input waypoints on a handheld GPS receiver.
9. Upon completion of the course the student will be able to plot a course using a handheld GPS receiver.
10. Upon completion of the course the student will be able to identify the keys and state their function on a handheld GPS receiver.
11. Upon completion of the course the student will be able to use a handheld GPS receiver to determine their precise location.
12. Upon completion of the course the student will be able to setup appropriate parameters on a handheld GPS receiver.
13. Upon completion of the course the student will be able to correlate data collected on a handheld GPS receiver with map data.

Upon completion of the course the student will be able to collect data using a handheld GPS receiver.

14. Upon completion of the course the student will be able to calculate distance by using time data.
15. Upon completion of the course the student will be able to calculate distance by using sound data.
16. Upon completion of the course the student will be able to define locational factors that affect GPS data collection.
17. Upon completion of the course the student will be able to identify dilution of precision errors.
18. Upon completion of the course the student will be able to correct dilution of precision positional errors.
19. Upon completion of the course the student will be able to identify and define the process by which GPS data is collected.
20. Upon completion of the course the student will be able to use three different methods to collect GPS data in the field.
21. Upon completion of the course the student will be able to collect GPS data while on a bicycle.
22. Upon completion of the course the student will be able to collect GPS data while in a motor vehicle.
23. Upon completion of the course the student will be able to collect GPS data while on foot.

Upon completion of the course the student will be able to correct GPS data error

24. Upon completion of the course the student will be able to identify and correct five different GPS positional errors.
25. Upon completion of the course the student will be able to identify and correct GPS clock errors.

26. Upon completion of the course the student will be able to identify and correct GPS receiver errors.
27. Upon completion of the course the student will be able to identify and correct GPS Ephemeris (Satellite Position) errors.
28. Upon completion of the course the student will be able to identify and correct GPS atmosphere errors.

Upon completion of the course the student will be able to integrate GPS data with GIS data

29. Upon completion of the course the student will be able to integrate GPS data into Arcview GIS software.
30. Upon completion of the course the student will be able to identify data that is in GPS trimble format.
31. Upon completion of the course the student will be able to convert GPS trimble format data into GIS macro format.
32. Upon completion of the course the student will be able to identify data that is in TIGER format.
33. Upon completion of the course the student will be able to merge TIGER format data with **GPS data**.

ASSESSMENT OF LEARNER OUTCOMES:

Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor's syllabus.

SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college's policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center, in Rm. 3354 or call at: 288-7670.

All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.