

Fall 2023

CE 602-101: Geographic Information System

Abdullah Shabarek

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JOHN A. REIF, JR. DEPARTMENT OF
**CIVIL AND ENVIRONMENTAL
ENGINEERING**



CE 602 - Geographic Information Systems - FALL 2023

NJIT Honor Code:

“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.”

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu”*

Course Description:

Introduce students to the basics of GIS and the application of practical engineering ideas with the linking of technology. This course teaches students the use of basic tools, such as QGIS software, used in the preparation of Civil Engineering visualization tools. QGIS is a widely used computer program for generating engineering visualization maps.

Canvas:

Students must use their UCID to sign in at (canvas.njit.edu). Some course material may be posted on Canvas. The instructor will advise when important information is uploaded.

QGIS Download Website:

<https://www.qgis.org/en/site/forusers/download.html>

For Windows:

<https://qgis.org/downloads/QGIS-OSGeo4W-3.32.2-1.msi>

For Mac:

<https://qgis.org/downloads/macOS/qgis-macos-pr.dmg>

Instructor: **Abdullah Shabarek, Ph.D., P.E.**

Email: Abdullah.shabarek@njit.edu

Suggested Text:

Introduction to Geographic Information Systems

Edition: 9th

Author: Kang-tsung Chang

ISBN10: 1260920712

Classroom Information:

Thursdays 18:00 – 20:50

Guttenberg Info Tech Center 2315A

Meeting	Topic/Assignment
1	Course Introduction <ul style="list-style-type: none"> • Student Introduction • Course Requirements • Introduction to QGIS
2	Coordinate Systems and Projections
3	Vector Data Model
4	<u>Project 1 handouts</u>
5	<u>Raster Data Model</u>
6	Spatial Analysis - Part 1
7	Spatial Analysis - Part 2
8	Final Project handouts Midterm Exam
9	Data Display and Cartography
10	<u>GIS Data Acquisition and Analysis</u>
11	GIS Applications
12	Final Project Development
13	Final Project Students Presentations – First Group
14	Final Project Students Presentations – Second Group

GENERAL COURSE INFORMATION

Grading Policy:

Homework Assignment	10 %
Project 1	20 %
Midterm Exam	20 %
Final Project	40 %
Participation and Attendance	10 %

Grading Scale:

A:	100-90
B+:	89-85
B:	84-80
C+:	79-75
C:	74-70
D:	69-60
F:	Below 60

Attendance Policy:

Students are expected to attend every class and sign in. In the event that you cannot attend class, you may request to attend one of the other sections as a make-up, however this is limited to availability and permission from the instructor. Students are responsible for submitting all homework, projects, assignments, quizzes, etc. on the due date (during class time). Students who miss assignments due to attendance must contact the Dean of Students to be excused for absences. Students who miss class with no valid excuse (as determined by the Dean of Students) will not be given any accommodations to complete work.

Withdrawals:

In order to insure consistency and fairness in application of the NJIT policy on withdrawals, student requests for withdrawals after the deadline will not be permitted unless extenuating circumstances (e.g., major family emergency or substantial medical difficulty) are documented. The course Professors and the Dean of Students are the principal points of contact for students considering withdrawals.

Assignment Policy:

*****ANY ASSIGNMENT THAT IS COPIED WILL BE SUBJECT TO DISCIPLINARY ACTION IN ACCORDANCE WITH THE NJIT HONOR CODE*****

Assignments are due at the beginning of class. Late assignments will NOT be accepted. All assignments are to be submitted in class on paper, unless otherwise requested, on the due date, or via email to srr3@njit.edu ON OR BEFORE the beginning of class on the due date. Email is ONLY to be used if you will be absent from class and shall not be the primary form of

submission.

Email Policy:

When emailing the instructor, you must provide your course and section number in the subject line. Also, although most email addresses will display your name, you must sign off with your full name at the bottom of each email. If you do not provide these two critical pieces of information, your email will not be responded to.

Syllabus Information:

The dates and topics of the syllabus are subject to change; however, students will be consulted with and must agree to any modifications or deviations from the syllabus throughout the course of the semester.

Outcomes Course Matrix – CE 101 Civil Engineering Computer Aided Design

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Use a team approach to problem solving			
Students will work in teams to develop engineering designs and solve problems	5	1, 2	Class Projects
Student Learning Outcome 2: Develop and practice basic functions in GIS software to communicate design concepts			
Introduce GIS concepts and develop engineering drawings	1, 3, 7	1, 2	HomeworkAssignments, and Class Projects
Student Learning Outcome 3: Develop and practice oral presentation skills			
Discuss various aspects of communication and its importance in the life of the Civil Engineer	3	1, 2	Discussions, Class Projects, Homework Assignments

CEE Mission, Program Educational Objectives and Student Outcomes

The mission of the Department of Civil and Environmental Engineering is:

- to educate a diverse student body to be employed in the engineering profession
- to encourage research and scholarship among our faculty and students
- to promote service to the engineering profession and society

Our program educational objectives are reflected in the achievements of our recent alumni:

1 – Engineering Practice: Alumni will successfully engage in the practice of civil engineering within industry, government, and private practice, working toward sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.

2 – Professional Growth: Alumni will advance their skills through professional growth and development activities such as graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as business and law through further education.

3 – Service: Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Our Student Outcomes are what students are expected to know and be able to do by the time of their graduation:

1. an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Revised: 2/13/18