NJIT
ECE788: ST: COMPUTATIONAL INTELLIGENCE
COURSE SYLLABUS
Fall 2025

Instructor: Dr. Qing Gary Liu, qliu@njit.edu.

Office Hours: Thursdays 4-6 PM (or by appointment).

Description: This course deals with the fundamental methods in computational intelligence. The emphasis is on evolutionary computing, artificial neural network, multiple objective optimization, clustering, and etc. Special attention is paid to Genetic Algorithm, Bees Algorithm, Ant Colony Optimization, and Swarm Intelligence.

Prerequisites: Undergraduate degree in Computer Engineering or Computer Science or equivalent.

Textbook (optional):

Rudolf Kruse, et. el., *Computational Intelligence: A Methodological Introduction*, Springer, 2013. ISBN 978-1-4471-5012-1

Nazmul Siddique, et. el., *Computational Intelligence: Synergies of Fuzzy Logic, Neural Networks and Evolutionary Computing*, John Wiley & Sons, 2013. ISBN 978-1-118-33784-4

COURSE OUTLINE

Weeks	Lecture
1	Introduction to Computational Intelligence and Evolution Computing
2-3	Genetic Algorithm and Simulated Annealing
4-5	Bees Algorithm and Applications, Ant Colony Optimization
6	Swarm Intelligence
7	Tabu Search, Scatter Search
8	**Midterm exam**
9-10	Workshop
11	Artificial Neural Network
12	Multiple Objective Optimization, Clustering
13-14	Project Report Presentation
15	**Final exam**

Grading Policy:

Midterm exam:	30%
Final exam:	30%
Paper presentation and Project	30%
Quiz	10%

Note that: 1) Make-up exams are allowed only if the absence is approved by NJIT. 2) This course uses absolute scale converting numerical grades to letter grades.

Students must notify in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

"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"*

Generative AI: the use of generative AI is NOT permitted for exams, quizzes, course projects and presentations, as doing so would undermine student learning and achievement of course learning outcomes listed above. Additionally, if and when students use AI in this course, the AI must be cited as is shown within the NJIT Library AI citation page for AI (https://researchguides.njit.edu/AI/home). If you have any questions or concerns about AI technology use in this class, please reach out to your instructor prior to submitting any assignments.