Course Name	Computational Intelligence		الذكاء الحسابي	
Course Information	Course Code	Course No.	Credit Hour	Prerequisite(s)
	0911-1678	678	3 (3-0-6)	**Machine Learning**
Course Track	☐ Program Core		☒ Electives	

Course Description

The course objective is to introduce basic principles of various computational methods of data processing in the emerging field of Computational Intelligence (CI). This course focuses on the three fundamental areas of CI which are neural network, fuzzy logic and evolutionary computing. It enumerates principles and techniques needed to formulate solutions to complex problems where traditional approaches are not feasible or effective in the field of pattern recognition, control, automated decision making, optimization, and statistical modeling. It introduces artificial neural networks, supervised, unsupervised and reinforced learning, fuzzy sets and systems, genetic algorithms, and swarm optimization. The student will apply these techniques to solve some real case studies.

Course Outcomes

After the completion of this course, the student will be able to:

1. **Describe** scope of CI and type of problems to be solved by CI methods **[A]**
2. **Assess** strengths and limitations of computation intelligence approaches **[A]**
3. **Formulate** a solution and argue its effectiveness solving computational intelligence problem **[C]**
4. **Design** and implement CI algorithms to solve real-world problems **[D]**
5. **Review** and present scientific research papers in the areas of computation intelligence **[E]**

Assessment Policy (TC)	Assignments	10%	Quiz	10%	Capstone Project	20 %
	Midterm	20%	Final	40%		

Textbook	Andries P. Engelbrecht, "Computational Intelligence: An Introduction", 2nd Edition, Wiley, 2007. ISBN-13: 978-0-470-03561-0.
References	1. Keller, James M. Liu, Derong, Fogel, David B., "Fundamentals of Computational Intelligence: Neural Networks, Fuzzy Systems, and Evolutionary Computation", 2nd Edition, Wiley-IEEE Press, 2016. ISBN-13: 978-1119214342. 2. Russell C. Eberhart, Yuhui Shi, "Computational Intelligence: Concepts to Implementations", 1st Edition, Morgan Kaufmann, 2007. ISBN-13: 978-1558607590.