Course Description Form

1. Course Name:	
Adaptive Systems	
2. Course Code:	
CSMM3214	
3. Semester / Year:	
Second / 2024 – 2025	
4. Description Preparation Date:	
2025/1/17	
5. Available Attendance Forms:	
Actual attendance in the form of theoretical and practical lectures	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 Hours / 3 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Hiba Basim Alwan Email: 110154@uotechnology.edu.iq	
8. Course Objectives	
Course Objectives	– Studying the concept of neural networks. – Studying the concept of genetic algorithm. – Studying the concept of fuzzy logic.
9. Teaching and Learning Strategies	
Strategy	• Providing the student with basic and secondary topics related to adaptive systems. • Translating theoretical topics and syllabus related to adaptive systems into computer-executable algorithms. • Asking the student to use algorithms related to the theoretical syllabus. • allowing the student to explain a small part of the class to his classmates to enhance his self-confidence. • Solve a small part of the homework to encourage students to complete the solution. • Giving class assignments and working in groups to solve these assignments.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	1, 2, 3, 4, 5, 6, 7	CH. 1: Neural Networks – Background. – The Neuron: Biological and Simulated Neuron. – Types of Learning Strategies.	Lectures	Ask questions and discuss them
2	4	1, 2, 3, 4, 5, 6, 7	– Back Propagation.	Lectures	Quiz
3	4	1, 2, 3, 4, 5, 6, 7	– Hopfield. – BAM.	Lectures	Ask questions and discuss them
4	4	1, 2, 3, 4, 5, 6, 7	– Kohonen.	Lectures	Homework
5	4	1, 2, 3, 4, 5, 6, 7	CH. 2: Genetic Algorithm – Introduction & historical view. – Components of algorithms: Selection methods and Operators.	Lectures	Quiz
6	4	1, 2, 3, 4, 5, 6, 7	– Crossover. Mutation.	Lectures	Quiz
7	4	1, 2, 3, 4, 5, 6, 7	– Parameters of GA. – GA and search methods.	Lectures	Ask questions and discuss them
8	4	---	---	---	---
9	4	1, 2, 3, 4, 5, 6, 7	Genetic Programming and Applications.	Lectures	Homework
10	4	1, 2, 3, 4, 5, 6, 7	CH. 3: Fuzzy Logic – Introduction.	Lectures	Quiz

			– Fuzzy sets: Continuous Fuzzy sets, Discrete Fuzzy sets.		
11	4	---	---	---	---
12	4	1, 2, 3, 4, 5, 6, 7	– Logical operators: Fuzzy intersection, Fuzzy implication, Fuzzy union.	Lectures	Quiz
13	4	1, 2, 3, 4, 5, 6, 7	– Compositional rule of inference (continuous & discrete). – Fuzzification & Defuzzification.	Lectures	Ask questions and discuss them
14	4	---	Review	Lectures	Ask questions and discuss them
15	4	---	Review	Lectures	Ask questions and discuss them

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	– Alian Rich, "Artificial Intelligence",1989. – William A. Stubblefield & Luger E.George, "Artificial Intelligence and the Design of Expert Systems", 1998. – Daniel Jurafsky and James H. Martin "Speech and language processing: Introduction to natural language processing, computational linguistics and speech recognition" second edition 2006. – Daniel H. Marcellus "Artificial Intelligence and the design of expert systems" 1998

Recommended books and references (scientific journals, reports…)	Approved Internet sites related to the topic of smart systems.
Electronic References, Websites	Any approved website related to the topic of smart systems.