جامعة : المنصورة
كلية : العلـــوم
قسـم : الرياضيات

١- بيانات المقرر		
كود المادة : Math 442	أسم المقرر: Neural networks	المستوى: الرابع
التخصص : الإحصاء وعلوم الحاسب	عدد الوحدات الدراسية: ٢ ساعة معتمدة نظرى ٢: تمارين: ٠ عملى: ١	

٢- هدف المقرر:	**For students undertaking this course, the aims are to:** A) Introduce the fundamental principles and techniques of neural network systems. • What kind of structure or model should we use? • How to train or design the neural networks? • How to use neural networks for information acquisition? B) Investigate the principal neural network models and applications.
٣- المستهدف من التدريس المقرر:	
أ-المعلومات والمفاهيم:	**a- Knowledge and Understanding :** **On completing this course, students will be able to:** a1- know History and structure. a2- know Networks of Artificial Neurons. a3- Learn about different applications in the domain. a4-describe real world problems in mathematical terms; especially problems of theoretical physics and environmental science. a5-understand mathematical models described in algebraic, analytical or topological terms. a6-gain a detailed knowledge of the main areas of mathematics: Foundations, Algebra, Analysis, Geometry and Probability, Applied mathematics (particularly Newtonian mechanics, differential equations, numerical methods and linear algebra), with the opportunity also to meet some of: advanced calculus, fluid mechanics, advanced numerical analysis as well as some fields of applications.
ب-المهارات الذهنية	**b- Intellectual Skills:** **On completing this course, students will be able to:** b1- distinguish the structure of Single Layer. b2- evaluate the need for quantitative models in real world problems. b3- understand and evaluate the passage from the mathematical model to the computer simulation.
ج- المهارات المهنية الخاصة بالمقرر:	**c-Professional and Practical Skills:** **On completing this course, students will be able to:** c1- work with logic programming language. c2- Learn and Generalize Single Layer. c3- Use the algorithm in small application. c4- apply it to small projects. c5-Use computers and appropriate software to solve mathematical problems. c6- Use statistical techniques and related software packages. c7- Present ideas and results in written and oral presentations.
د- المهارات العامة :	**d-General and Transferable Skills:** **On completing this course, students will be able to:** d1- Biological Neurons and Neural Networks. d2- perform applications.

d3- develop computer skills: use computer and internet. d4- develop self and long-life learning.	
• Introduction to Neural Networks. • Single Layer Perceptrons. • Multi-Layer Perceptrons. • Learning Algorithms. • Back Probagation Algorithm. • Conjugate Gradient Learning. • Application Single character recognition.	٤- محتوى المقرر:
1- Lecturing on board. 2- Having free discussions. 3- Asking the students some questions.	٥- اساليب التعليم والتعلم:
The same as normal students, only skeletal disabilities are allowed in the Faculty of Science.	٦- أساليب التعليم والتعلم للطلاب ذوى القدرات المحدودة:
٧- تقويم الطلاب :	
1- Final exam to assess 2- Oral exam to assess 3- Mid-Term Exam to assess 4- Practical Exam to assess	أ- الأساليب المستخدمة :
1- Final exam week 16 2- Oral exam week 16 3- Mid-Term Exam week 7 4- Practical Exam week	ب- التوقيت :
- Mid-Term Examination 10% - Final-Term Examination 60% - Oral Examination 10% - Practical Examination 20% Total 100%	ج- توزيع الدرجات :
٨- قائمة الكتب الدراسية والمراجع :	
	أ- مذكرات:
- An Introduction to Neural Networks By K Gurney . Publisher :Routledge, 1997.	ب- كتب ملزمة
- Neural Networks: A Comprehensive Foundation By S. Haykin Prentice Hall, 1999.	ج- كتب مقترحة :
	د- دوريات علمية أو نشرات..

مصفوفة المعارف والمهارات المستهدفة من المقرر الدراسى

المحتويات للمقرر	أسبوع الدراسة	المعارف الرئيسية	مهارات ذهنية	مهارات مهنية	مهارات عامة
• Introduction to Neural Networks.	1,2	a1		c1	d1
• Single Layer Perceptrons.	3,4	a2	b1	c2	
• Multi-Layer Perceptrons.	5,6,7,8	a3		c3	d2
• Learning Algorithms, Back Probagation Algorithm.	9,10,11	a4	b2	c4,c5,	d3
• Conjugate Gradient Learning.	12	a5	b3	c6	d4
• Application Single characcter recognition.	13	a5,a6	b3	c7	d4

أستاذ المادة : د./حازم مختار مختار البكرى

رئيس مجلس القسم العلمي : ا.د. مجدى الياس فارس