

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### COURSE SPECIFICATION

The objective of this course is to learn the fundamentals of deep learning and the associated algorithms.

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1. Teaching Institution	Al-Nahrain University / College of Science
2. University Department/Centre	Computer Department
3. Course title/code	Deep Learning
4. Modes of Attendance offered	Full time
5. Semester/Year	Second Semester / 2020-2021
6. Number of hours tuition (total)	45 hours
7. Date of production/revision of this specification	24/6/2022
8. Aims of the Course	<p>This course discusses the latest deep learning models that researchers are recently using. The various deep structures and their components are discussed in detail.</p> <p>It also discusses the algorithms used to train deep architectures to improve deep models. These deep architectures are not only capable of learning complex tasks but can even outperform humans in some dedicated applications.</p>

9. Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Cognitive goals .

- A1. The Basics of Deep Learning architectures.
- A2. Basics of Supervised Deep Learning
- A3. Training Supervised Deep Learning Networks
- A4. Supervised Deep Learning Architectures
- A5. Unsupervised Deep Learning Architectures

B. The skills goals special to the course.

- B1. Ability to design deep machine architectures.
- B2.

Teaching and Learning Methods

- Books
- Lecture notes
- Powerpoint

Assessment methods

- Monthly exams
- Classroom participation and discussions

C. Affective and value goals

- C1. Question: Looking for new information and raising questions
- C2. Conclusion and Deduction: Thinking about what is beyond the available information to fill the gap
- C3.
- C4.

Teaching and Learning Methods

- Describe, discuss

Assessment methods

- Exams, Quizzes

D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)

D1. Analytical ability

D2 - The skill of simplifying the known architectures

D3- The skill of discussion and exchange of ideas

D4.

## 10. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		<ul style="list-style-type: none"> <li>• Shallow Learning</li> <li>• Why to Use Deep Learning</li> <li>• How Deep Learning Works</li> </ul>	عرض، شرح ومناقشة	الفعالية داخل الصف
2	3		<ul style="list-style-type: none"> <li>• Convolutional Neural Network (ConvNet/CNN)</li> <li>• Convolution Operation</li> </ul>	=	=
3	3		<ul style="list-style-type: none"> <li>• Architecture of CNN.</li> </ul>	=	=
4	3		<ul style="list-style-type: none"> <li>• Training Convolution Neural Networks</li> </ul>	=	=
5	3		<ul style="list-style-type: none"> <li>• Loss Functions and Softmax Classifier</li> </ul>	=	=
6	3		<ul style="list-style-type: none"> <li>• Gradient Descent-Based Optimization Techniques</li> <li>• Challenges in Training Deep Networks</li> </ul>	=	=
7	3		<ul style="list-style-type: none"> <li>• Weight Initialization Techniques</li> </ul>	=	=
8	3		<ul style="list-style-type: none"> <li>• Mid1</li> </ul>		
9	3		<ul style="list-style-type: none"> <li>• LeNet-5</li> <li>• AlexNet</li> <li>• ZFNet</li> </ul>	=	=
10	3		<ul style="list-style-type: none"> <li>• VGGNet</li> <li>• GoogleNet</li> <li>• ResNet</li> </ul>	=	=
11	3		<ul style="list-style-type: none"> <li>• (DenseNet)</li> <li>• Capsule Network</li> </ul>	=	=
12	3		<ul style="list-style-type: none"> <li>• Restricted Boltzmann Machine (RBM)</li> </ul>	=	=

13	3		• Mid2		
14	3		• Deep Belief Network • Deep Autoencoders	=	=
15	3		• Generative Adversarial Networks	=	=

11. Infrastructure	
1. Books Required reading:	Advances in Deep Learning, 2020
2. Main references (sources)	2019 Dive in Deep Learning 2019 Hands-On Machine Learning with Scikit-Learn and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems, Orielly
A- Recommended books and references (scientific journals, reports...).	
B-Electronic references, Internet sites...	Youtube –Andrew Ng
12. The development of the curriculum plan	