



Jordan University of Science and Technology
Faculty of Computer & Information Technology
Artificial Intelligence Department

AI342 Deep Learning - JNQF Level: 7

First Semester 2025-2026

Course Catalog

3 Credit Hours. Deep Learning (DL) is a pivotal skill in artificial intelligence, renowned for its applications in achieving state-of-the-art results in various tasks within Computer Vision and Natural Language Processing (NLP). This course offers an in-depth exploration of DL foundations, enabling students to build, train, and implement neural networks effectively and efficiently. In this course, students will learn various neural network architectures, understand how to optimize network performance and apply deep learning to solve complex problems in NLP and computer vision. This course will cover MLP neural networks, Sequence modeling techniques (RNN, LSTM, seq2seq etc.), attention mechanism, encoder-decoder architecture, convolutional neural networks, Adversarial neural networks, transfer learning, as well as some topics that are necessary for successful network training such as optimization methods (SGD, momentum, Adam), dropout, batch normalization, model selection and model evaluation. The course will also introduce the students to some NLP and computer vision tasks using deep learning. The final project will involve developing and training a deep neural network model and applying it to an interesting problem.

Teaching Method: On Campus

Text Book

Title	Deep Learning: Foundations and Concepts
Author(s)	by Christopher M. Bishop (Author), Hugh Bishop (Author)
Edition	1st Edition
Short Name	TB
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#1	Deep Learning	Ian Goodfellow, Yoshua Bengio, and Aaron Courville	1st Edition	
Ref#2	Deep Learning and its Applications using Python	by Niha Kamal Basha , Surbhi Bhatia Khan , Abhishek Kumar , Arwa Mashat	1st Edition	

Ref#3	Neural Networks and Deep Learning: A Textbook	Charu C. Aggarwal	1st Edition
-------	---	-------------------	-------------

Instructor	
Name	Dr. Rasha Obeidat
Office Location	-
Office Hours	
Email	rmobeidat@just.edu.jo

Class Schedule & Room
<p>Section 1: Lecture Time: Sun, Tue, Thu : 12:00 - 13:00 Room: G2122</p> <p>Section 2: Lecture Time: Sun, Tue, Thu : 11:00 - 12:00 Room: G2122</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
1792490	AI249 Machine Learning	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	The Deep Learning Revolution	1.1 and 1.2 From TB
Weeks 3, 4	Single-layer Networks(Regression) and Gradient Decent.	Ch4 From TB
Weeks 5, 6	Feedforward Neural Networks	Ch6 From Ref#1
Week 7	Training Deep Neural Networks: Hyperparameter Tuning, Regularization, Optimization, Evaluation Metrics	
Weeks 8, 9	Convolutional neural Networks	Ch9 From TB , Ch10 From Ref#1
Week 10	Sequence Modeling-RNN,LSTM,GRU	12.2.5 From TB
Week 11	Transfer Learning	
Week 12	Reinforcement learning	
Week 13	Generative Adversarial Neural Networks	Ch17 From TB

Week 14	Project Group Presentation and Discussion	
---------	---	--

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Explain the core concepts of deep learning, including activation functions, single-layer networks, and feedforward neural networks. [1SO1] [1L7K1]	20%	
Discuss the architecture and functionality of convolutional neural networks (CNNs) and their role in solving visual tasks. [1SO1] [1L7K1]	15%	
Analyze sequence modeling approaches using RNNs, LSTMs, and GRUs, and describe their applications to temporal data. [1SO1] [1L7K1]	13%	
Identify and evaluate advanced deep learning topics such as transfer learning, evaluation metrics, and generative adversarial networks (GANs). [1SO1] [1L7K1]	17%	
Apply deep learning concepts through assignments and a final project involving design, implementation, evaluation, and presentation of models for real-world problems. [1SO2] [1L7S1]	35%	

Relationship to Program Student Outcomes (Out of 100%)					
SO1	SO2	SO3	SO4	SO5	SO6
65	35				

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S1
65	35

Evaluation	
Assessment Tool	Weight
Midterm Exam	25%
Assignments	20%
Project	15%
Final Exam	40%

Policy	
Attendance	Attendance is very important for the course. In accordance with university policy, students missing more than 20% of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class
Exams	All exams will be CLOSE-BOOK; necessary algorithms/equations/relations will be supplied if required.

Assignments	Assignments must be submitted before due date, there will be discussions for the assignments scheduled after submissions.
Instructor Copyright Policy	<p>The instructor copyrights all course materials, including slides, assignments, project descriptions, and other instructional content.</p> <p>-Usage Restrictions: You may not publish, distribute, or share these materials online or in any form without explicit permission.</p> <p>You are not allowed to record, reproduce, or distribute lecture content (including audio, video, or written notes).</p> <p>Academic Integrity Reminder: Violating these policies may result in disciplinary action in accordance with university regulations.</p>
No Shared Projects or Assignments Across Courses	<p>No Shared Projects or Assignments Across Courses</p> <p>--Policy Statement:</p> <p>-Students are strictly prohibited from submitting the same assignment, project, or solution to this course if it has already been submitted for another course.</p> <p>--Key Rules:</p> <p>-Assignments and projects must be original and specific to this course.</p> <p>-Reusing or repurposing work from another course is considered academic misconduct.</p> <p>-Violations may result in penalties or disciplinary actions as per university guidelines.</p> <p>-- Exceptions:</p> <p>-If explicit permission is granted by both instructors for cross-course collaboration.</p>

Date Printed: 2025-10-11