

| Neural Networks and Deep Learning - 2026<br>Theoretical foundations |            |           |       |       |          | Online lectures on Teams                      |
|---------------------------------------------------------------------|------------|-----------|-------|-------|----------|-----------------------------------------------|
| #                                                                   | Date       | Day       | Time  | hours | Teacher  | Topic                                         |
| 1                                                                   | 13/01/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Basic concepts and learning paradigms         |
| 2                                                                   | 14/01/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Unsupervised learning                         |
| 3                                                                   | 20/01/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Clustering algorithms                         |
| 4                                                                   | 21/01/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Reinforcement learning - part 1               |
| 5                                                                   | 27/01/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Reinforcement learning - part 2               |
| 6                                                                   | 28/01/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Supervised learning                           |
| 7                                                                   | 03/02/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Performance metrics and RBF networks          |
| 8                                                                   | 04/02/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Towards deep networks: problems and solutions |
| 9                                                                   | 10/02/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Autoencoders and Convolutional networks       |
| 10                                                                  | 11/02/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Convolutional networks for classification     |
| 11                                                                  | 17/02/2026 | Martedì   | 09:00 | 2.5   | Buttazzo | Convolutional networks for object detection   |
| 12                                                                  | 18/02/2026 | Mercoledì | 09:00 | 2.5   | Buttazzo | Convolutional networks for segmentation       |

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| Neural Networks and Deep Learning - 2026<br>Advanced Topics |            |           |       |       |          | Online lectures on Teams                 |
|-------------------------------------------------------------|------------|-----------|-------|-------|----------|------------------------------------------|
| #                                                           | Date       | Day       | Time  | hours | Teacher  | Topic                                    |
| 1                                                           | 24/02/2026 | Martedì   | 09:00 | 2     | Buttazzo | Recurrent Neural Networks                |
| 2                                                           | 25/02/2026 | Mercoledì | 09:00 | 2     | Buttazzo | Natural Language processing              |
| 3                                                           | 03/03/2026 | Martedì   | 09:00 | 2     | Buttazzo | Transformers                             |
| 4                                                           | 04/03/2026 | Mercoledì | 09:00 | 2     | Buttazzo | Deep reinforcement learning              |
| 5                                                           | 10/03/2026 | Martedì   | 09:00 | 2     | Buttazzo | Policy gradient RL                       |
| 6                                                           | 11/03/2026 | Mercoledì | 09:00 | 2     | Buttazzo | Model-based RL                           |
| 7                                                           | 17/03/2026 | Martedì   | 09:00 | 2     | Buttazzo | Semi-Supervised and Contrastive Learning |
| 8                                                           | 18/03/2026 | Mercoledì | 09:00 | 2     | Buttazzo | Special deep learning models             |
| 9                                                           | 24/03/2026 | Martedì   | 09:00 | 2     | Buttazzo | Multi-object tracking                    |
| 10                                                          | 25/03/2026 | Mercoledì | 09:00 | 2     | Buttazzo | Generative Networks                      |

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| Neural Networks and Deep Learning - 2026<br>Trustworthy AI |            |           |       |       |           | Online lectures on Teams                          |
|------------------------------------------------------------|------------|-----------|-------|-------|-----------|---------------------------------------------------|
| #                                                          | Date       | Day       | Time  | hours | Teacher   | Topic                                             |
| 1                                                          | 31/03/2026 | Martedì   | 09:00 | 2     | Rossolini | Explainable and Interpretable AI                  |
| 2                                                          | 01/04/2026 | Mercoledì | 09:00 | 2     | Rossolini | Anomaly and out-of-distribution detection methods |
| 3                                                          | 07/04/2026 | Martedì   | 09:00 | 2     | Rossolini | Domain generalization and domain adaptation       |
| 4                                                          | 08/04/2026 | Mercoledì | 09:00 | 2     | Rossolini | Attention mechanisms in computer vision           |
| 5                                                          | 14/04/2026 | Martedì   | 09:00 | 2     | Nesti     | Adversarial attacks and defenses                  |
| 6                                                          | 15/04/2026 | Mercoledì | 09:00 | 2     | Nesti     | Real-world attacks and defenses                   |
| 7                                                          | 21/04/2026 | Martedì   | 09:00 | 2     | Nesti     | Simulators for autonomous driving                 |
| 8                                                          | 22/04/2026 | Mercoledì | 09:00 | 2     | Nesti     | HW in the loop simulation                         |
| 9                                                          | 28/04/2026 | Martedì   | 09:00 | 2     | Casini    | Functional components in autonomous driving       |
| 10                                                         | 29/04/2026 | Mercoledì | 09:00 | 2     | Casini    | The Autoware framework for autonomous driving     |

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| Neural Networks and Deep Learning - 2026<br>Implementation issues |            |           |       |       |          | Online lectures on Teams                            |
|-------------------------------------------------------------------|------------|-----------|-------|-------|----------|-----------------------------------------------------|
| #                                                                 | Date       | Day       | Time  | hours | Teacher  | Topic                                               |
| 1                                                                 | 05/05/2026 | Martedì   | 09:00 | 3     | Buttazzo | Implementing NN in C. Implementations of RL models. |
| 2                                                                 | 06/05/2026 | Mercoledì | 09:00 | 3     | Buttazzo | Implementations of multi-layer networks             |
| 3                                                                 | 12/05/2026 | Martedì   | 09:00 | 2     | Casini   | Frameworks for training and inference of DNNs       |
| 4                                                                 | 13/05/2026 | Mercoledì | 09:00 | 2     | Casini   | Modeling DNNs in Tensorflow and Pytorch             |
| 5                                                                 | 19/05/2026 | Martedì   | 09:00 | 2     | Biondi   | Accelerating deep networks on GPGPUs                |
| 6                                                                 | 20/05/2026 | Mercoledì | 09:00 | 2     | Biondi   | DNN optimization for embedded platforms             |
| 7                                                                 | 26/05/2026 | Martedì   | 09:00 | 2     | Biondi   | Accelerating DNNs on FPGA                           |
| 8                                                                 | 27/05/2026 | Mercoledì | 09:00 | 2     | Aromolo  | GPU programming in CUDA                             |
| 9                                                                 | 26/05/2026 | Martedì   | 09:00 | 2     | Aromolo  | The NVIDIA TensorRT framework                       |
| 10                                                                | 03/06/2026 | Mercoledì | 09:00 | 2     | Aromolo  | The NVIDIA TensorRT framework - advanced topics     |
| 11                                                                | 04/06/2026 | Giovedì   | 09:00 | 2     | Aromolo  | The Xilinx Deep Processing Unit (DPU)               |

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