| Course Title | Deep Learning |
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| Semester | Spring (semester 2) |
| Inholland Faculty | Engineering, Design and Computing |
| Language of instruction | English |
| Cycle | First cycle/undergraduate/Bachelor level |
| Inholland Location | Diemen |
| Code Subjects | To be determined |
| Number of ECTS | 30 |
| Content subjects | **Topics covered in lectures and assignments:**<br>• Introduction to neural networks and deep learning<br>• Mathematical foundations of deep learning<br>• Building a basic deep learning model in Tensorflow/Keras<br>• Evaluating a model using Tensorflow/Keras<br>• Image recognition using convolutional neural networks<br>• Using pretrained networks<br>• Sequence learning using recurrent neural networks<br>• Text processing<br>• Generative deep learning<br>**Aspects covered in the project:**<br>• Preparing a data set for deep learning<br>• Selecting a model architecture and/or pretrained model<br>• Training a model using Tensorflow/Keras<br>• Optimizing a model using parameter tuning<br>• Evaluating the value of a model |
| Lecturer(s) | To be decided |
| Learning outcomes | After completing the minor the student is able to:<br>• Explain the working of a deep learning model<br>• Choose an appropriate deep learning architecture for a real-world problem<br>• Prepare data sets for deep learning using Python |

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| | • Train fully connected, convolutional, and recurrent deep learning models using Tensorflow/Keras<br>• Conduct experiments to evaluate deep learning models |
| **Mode of delivery, planned activities and teaching methods** | The Deep Learning minor spans over a period of 20 weeks, from February to June 2024.<br>Contact hours: 4 days (maximum) per week at school |
| **Prerequisites and co-requisites (if applicable)** | The minor is open for 3rd and 4th year Bachelor students. The following skills are required:<br>• Python programming<br>• Basic statistics<br>• Basic algebra |
| **Recommended or required reading and/or other learning resources/tools** | Francois Chollet, Deep Learning with Python, Manning Publications |
| **Assessment methods and criteria** | Written exam (4 EC)  Individual presentation (3 EC)<br>Individual Assignments (8 EC)  Group Project (15 EC) |