

## Elective course: Deep Learning

Title	Elective course: Deep Learning
Semester	E2025
Master programme in	Computer Science
Type of activity	Course
Teaching language	English

You register for activities through [stads selvbetjening](#) during the announced registration period, which you can see on the [Study administration homepage](#).

Study regulation	When registering for courses, please be aware of the potential conflicts and overlaps between course and exam time and dates. The planning of course activities at Roskilde University is based on the recommended study programmes, which should not overlap. However, if you choose optional courses and/or study plans that goes beyond the recommended study programmes, an overlap of lectures or exam dates may occur depending on which courses you choose.
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### REGISTRATION AND STUDY ADMINISTRATIVE

Registration	Read about the Master Programme and find the Study Regulations at <a href="#">ruc.dk</a>
Number of participants	
ECTS	5
Responsible for the activity	Henning Christiansen ( <a href="mailto:henning@ruc.dk">henning@ruc.dk</a> )
Head of study	Henrik Bulskov ( <a href="mailto:bulskov@ruc.dk">bulskov@ruc.dk</a> )
Teachers	
Study administration	IMT Registration & Exams ( <a href="mailto:imt-exams@ruc.dk">imt-exams@ruc.dk</a> )
Exam code(s)	U60598

### ACADEMIC CONTENT

Overall objective The purpose of elective courses is to give the student opportunities to specialize within a specific subject area, where the student acquires knowledge, skills and competences in order to translate theories, methods and solutions ideas into their own practice.

The course recaps fundamental concepts of Machine Learning and Artificial Neural Networks. The course includes:

Detailed description of content

- Deep learning (DL) architectures and tool
- Different types of deep networks.
- Selected topics in image analysis and applications with DL, Large Language Models
- Defining deep learning tasks, prepare data, train and deploy deep models.

A substantial part of the course consists of students working in groups on a selected topic, involving setting up, training, testing and experimenting with deep neural network models, as a basis for the written product.

Software tools: Python, TensorFlow, Keras (some familiarity with Python is an advantage).

Course material and Reading list François Chollet: Deep learning with Python, Third Edition. Manning, 2025.

Course notes and scientific papers made available on moodle.

The course's 5 ECTS correspond to a total of 135 hours workload with:

Overall plan and expected work effort

- 40 hours lectures and exercises,
- 70 hours of preparation over a 10 week course period, and
- 25 hours for the exam and preparation before the course period.

Format

Evaluation and feedback Evaluation form to be filled out (anonymously) plus open discussion on the last course day.

Programme

## ASSESSMENT

After completing this course, students will be able to:

Overall learning outcomes

- demonstrate knowledge within a defined subject area.
- demonstrate an overall overview and understanding of the general principles behind the field's theory, methods and technological solutions.
- choose and apply appropriate methods and techniques relevant to the field to analyse, design and implement solutions
- work with it-related problems within their field, both individually and in groups.
- be proficient in new approaches within the subject area in a critical and systematic way and thereby independently take responsibility for their own professional development.

Individual oral exam based on a written product

The character limit of the written product is maximum 48,000 characters, including spaces.

The character limits include the cover, table of contents, bibliography, figures and other illustrations, but exclude any appendices.

Form of examination

Time allowed for exam including time used for assessment: 20 minutes. The assessment is an overall assessment of the written product(s) and the subsequent oral examination.

Permitted support and preparation materials for the oral exam: All.

Assessment: 7-point grading scale

Moderation: Internal co-assessor.

Form of Re-examination

Samme som ordinær eksamen / same form as ordinary exam

Type of examination

in special cases

### **Examination and assessment criteria**

The assessment is based on the quality of the written product and the extent to which the student can:

- explain the work behind the written product (see above) and relate this to the theories, methods and concepts covered in course,
- demonstrate a general overview of the theories, methods and concepts covered in course.

### **The use of generative AI aids in exams**

In this course, generative AI aids (GAI) are permitted in the work with the exam if the use is declared.

Examination and assessment criteria (implemented) You must clearly declare how you have used generative artificial intelligence (GAI). This can be included as part of a methodology section or as a short statement at the end of your exam paper. This means that you must describe how you have used GAI, e.g. for the preparatory work on the assignment, to ask questions and search for information, to receive feedback and criticism on your text, to carry out proofreading or to improve language and readability. It is important that you actively relate to your choice of tools in this way, as it is part of the entire process of creating the assignment, and thus part of your scientific method and professional communication.

The use of any specific text that is GAI-generated requires citation, just as when using all other sources from which direct quotations are used.

[In the library's guide](#), you can see more about how to cite AI and how you can account for your use of GAI.

However, ordinary spell checking and other language suggestions, such as those known from Word or other word processing programs, as well as programs for writing minutes and transcription, are permitted to be used in all written exams and do not need to be declared.

The use of generative artificial intelligence (GAI) must always take place within the framework of Roskilde University's 'Guidelines for using

generative artificial intelligence in written exams.' [Read the guidelines here.](#)

Exam code(s) Exam code(s) : U60598

## Course days:

**Hold: 1**

### **Elective course: Deep Learning**

time 10-09-2025 12:15 til  
10-09-2025 16:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 17-09-2025 12:15 til  
17-09-2025 16:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 24-09-2025 12:15 til  
24-09-2025 16:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 01-10-2025 12:15 til  
01-10-2025 16:00

location 12.1-073 - teorilokale i 12.1 (30)

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 08-10-2025 12:15 til  
08-10-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 15-10-2025 12:15 til  
15-10-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 22-10-2025 12:15 til  
22-10-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 29-10-2025 12:15 til  
29-10-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 05-11-2025 12:15 til  
05-11-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

### **Elective course: Deep Learning**

time 12-11-2025 12:15 til  
12-11-2025 16:00  
location 12.1-073 - teorilokale i 12.1 (30)  
Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

**Elective course: Deep Learning**

time 19-11-2025 09:00 til  
19-11-2025 10:00

**Elective course: Deep Learning**

time 12-01-2026 08:15 til  
13-01-2026 18:00

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )

**Elective course: Deep Learning**

time 23-02-2026 09:00 til  
23-02-2026 10:00

**Elective course: Deep Learning**

time 27-02-2026 08:15 til  
27-02-2026 18:00

Teacher Henning Christiansen ( [henning@ruc.dk](mailto:henning@ruc.dk) )