

Artificial Intelligence

Algorithms and Applications with Python

Exam Preparation



TECHNISCHE
UNIVERSITÄT
DARMSTADT

WIRTSCHAFTS
INFORMATIK



AIAA 1 + 2



Dr. Dominik Jung
dominik.jung42@gmail.com

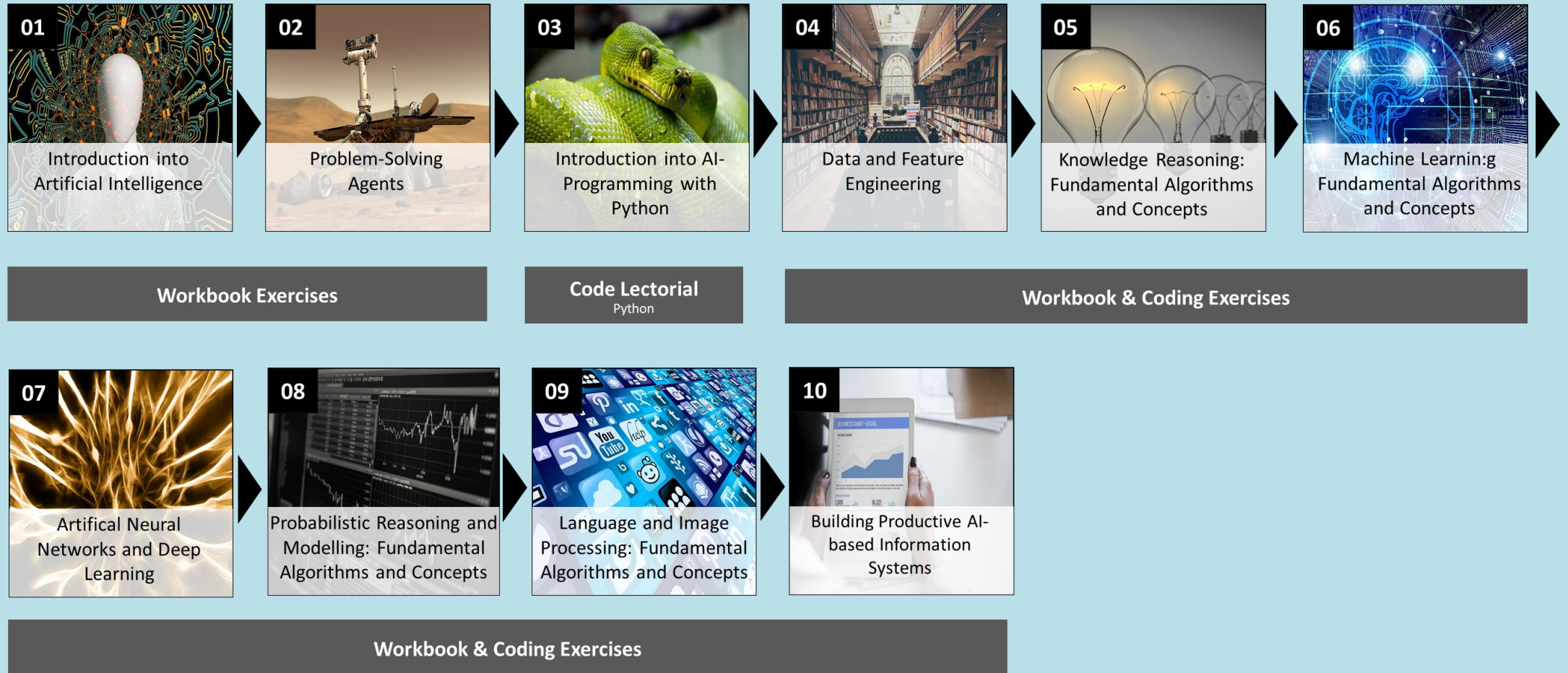
Agenda

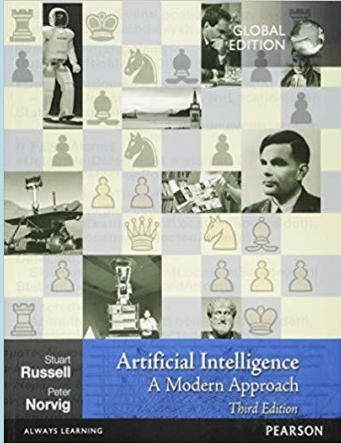
5.1 Exam Organisation and Preparation

5.2 Questions and Restrictions

5.3 Course Evaluation and Discussion

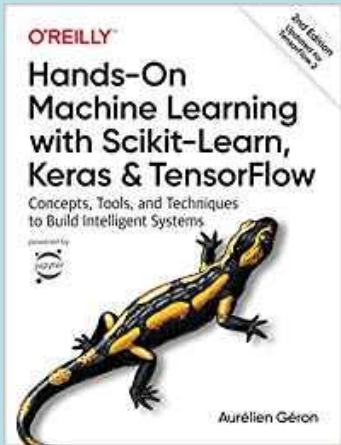
Course Overview





Russell, S., & Norvig, P. (2016). *Artificial Intelligence: A Modern Approach*. Global Edition.

► Availability: ↗ [University Library Darmstadt](#) | ↗ [Amazon](#)



Géron, A. (2017). *Hands-on machine learning with Scikit-Learn and TensorFlow: Concepts, tools, and techniques to build intelligent systems*.

► Availability: ↗ [University Library Darmstadt](#) | ↗ [Amazon](#)

Previous Exams are Online Available

EXAM

Course: Artificial Intelligence – Algorithms and Applications with Python

Date: 2021/

Name: _____

Matr.-Nr.: _____

Section	1	2	3	Σ
Points				

master 1 branch 0 tags



dominikjung42 added slides for chapter 9



Capstone project

added capstone slides for AI capstone 20



Code

added new slides for chapter 7



Exams

updated slides



Exercises

added solutions for exercise sheet #5



Guest lectures

Updated lecture syllabus



Lectorials

added code and slides for lectional 5 (chap



Lecture

added slides for chapter 9



Media

added age of empires II AI guideline



README.md

added lectional 1

Closed Book and Closed Notes Exam (preliminary!)

33 %

BASIC CONCEPTS AND THEORETICAL BACKGROUND

- You will have to answer multiple questions related to basic concepts of the lecture or give basic definitions or formulas.
- Aka “knowledge questions”.

33 %

APPLYING THEORY TO PRACTICE

- You will have to show that you understand the algorithms and concepts and that you can use them to solve a (business/real-life) problem.
- For this kind of task you might need your calculator or geometrical triangle, pen and eraser.

34 %

PROGRAMMING

- You will have to write, read and understand code examples in the context of artificial intelligence problems (search, machine learning, etc.).
- Use the exercises, lectorials and the code examples to prepare!

Note: It may be possible that the point distribution differs in the final exam

Example: Basic Concepts and Theoretical Background

1. Many people have tried to define the concept “*Artificial intelligence (AI)*”. The most popular one in AI is the definition from McCarthy. Please give his definition of *Artificial Intelligence* we have discussed in lecture. (1 P)

Example: Application of Theoretical Concepts

1. Describe the following problem using a Markov chain. In particular, determine the state space, transition matrix, and transition graph of the Markov chain. Explain

Example: Programming

1. Please give python code to start and initialize the perceptron with the dataset start_weights? (1 P)

How to start

- Start to recapitulate the storyline of the lecture. Read the related chapters of the literature if you feel unsecure or repeat the video recordings of the lecture
- Answer all the classroom tasks, discuss the results with your learning group
- Take a deeper dive at the coding exercises. Solve the coding exercises of each chapter
- Solve the previous exams that are online available!



Which Content is Relevant for the Exam?

Outline

2 Artificial Intelligence and Information Systems

2.1 Artificial Intelligence Project Management

2.2 Artificial Intelligence Project Lifecycle

2.3 Skills and Roles in Artificial Intelligence Projects

2.4 Types of Artificial Intelligence based Information Systems

► What we will learn:

- How typical AI projects are implemented, and how their life cycle and phases look like
- What skills are needed to implement an AI project
- Why the industry needs AI specialists, and how typical AI jobs look like
- Which types of AI based information systems exist and how they can be used to solve real-world problems



Image source: [Pixabay](#) (2019) / [CC0](#)

► Duration:

- 120 min

► Relevant for Exam:

- 2.1-2.4

Artificial Intelligence: Building AI-Based Information Systems with Python - Dr. Dominik Jung

Note: There might still be questions where you might need a basic understanding of the content of the excluded chapters

Always exam relevant

- **Lecture slides, lectorials and exercises** (*except excluded chapters on the overview*)
- **Referenced chapters of the course books and all literature downloads** available in GIT (*look at the folder "literature"*)
- The **handouts** for the business cases and the **discussion results**
- **Every teaching material** accompanying this lecture (**code examples**, guest lectures etc.)

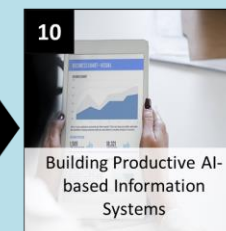
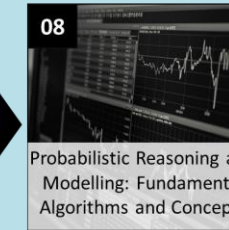
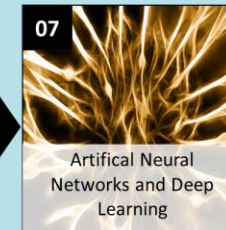
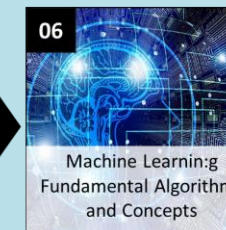
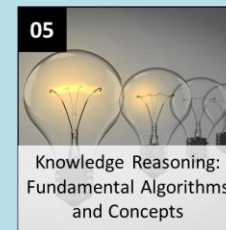
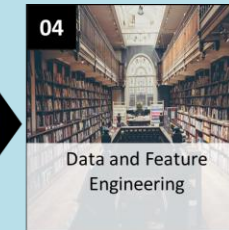
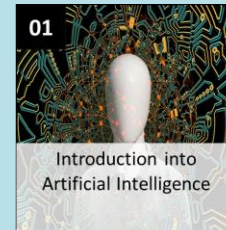


Overview Relevant Chapters

Regularly relevant chapters for the exam

Semester 1						
1.1	2.1	3.1	4.1	5.1	6.1	Lectorial 1
1.2	2.2	3.2	4.2	5.2	6.2	Lectorial 2
1.3	2.3	3.3	4.3	5.3	6.3	Lectorial 3
1.4	2.4		4.4	5.4	6.4	Lectorial 4
	2.5		4.5	5.5	6.5	
				6.6		Exercises

Semester 2						
7.1	8.1	9.1	10.1	Lectorial 5		Capstone
7.2	8.2	9.2	10.2	Lectorial 6		Case challenge
7.3	8.3	9.3	10.3	Lectorial 7		Guest lecture
7.4	8.4	9.4	10.4			
	8.5		10.5	Exercises		



! The lecture is **updated every semester**, hence the **content can be slightly different** each time. If you decide to write the exam next semester do not forget to **check for updated content!**

For once, the following subchapters are not tested explicitly for the **written** exam for **this** semester:

7.2 - 7.4 and 8.2 - 8.4

Questions