


## International Summer University<sup>WU</sup> 2025

WU (Vienna University of Economics and Business)

### Course Outline

Course Title	AI in Management	
<b>Instructor</b>	Harald Puhr <a href="mailto:harald.puhr@wu.ac.at">harald.puhr@wu.ac.at</a>  WU Vienna University of Economics and Business Institute for International Business	
<b>Language of instruction</b>	English	
<b>Course level</b>	Undergraduate	
<b>Contact hours</b>	35 teaching hours (45 min. each)	

#### Aim of the Course

This course explores the transformative role of Artificial Intelligence (AI) in managerial decision-making and its applications to address real-world business challenges. Students will gain a comprehensive understanding of how AI technologies, such as machine learning and natural language processing, can be leveraged to solve complex problems across various business domains, including marketing, operations, and finance. The course emphasizes the interdisciplinary nature of AI, bridging technical concepts with core business principles to prepare students for the strategic integration of AI in organizational settings. Additionally, students will explore ethical and societal implications to ensure responsible AI adoption. The program integrates theoretical knowledge with hands-on experience, allowing students to directly apply AI algorithms and data analytics techniques to practical scenarios using the R programming language.

#### Learning Objectives

##### *Cognitive Objectives*

1. Understand the importance of AI for decision-making in management and organizations.
2. Gain a foundational understanding of AI technologies, including machine learning and natural language processing, and their business implications.
3. Understand how human learning and machine learning are related but different.
4. Critically analyze the ethical, societal, and regulatory aspects of AI adoption.

##### *Practical Objectives*

1. Define AI-driven analysis and implementation plans for specific managerial challenges.
2. Develop strategies and proposals for AI applications in real-world business scenarios.
3. Implement simple data analyses in the R programming language, including regression and machine learning models.

#### Application Requirements and / or Prerequisites

Application requirements for the International Summer University WU can be found [on the ISU WU website](#).

Applicants interested in participating in the International Summer University<sup>WU</sup> need an excellent command of the English language. The English language requirements can be found at [ISU<sup>WU</sup> Language Requirements](#).

Prior knowledge in working/coding with R or Python is helpful, but not a prerequisite.

### Teaching Methods

The program combines theoretical input from the instructor with interactive exercises and hands-on applications during class. Students will work in teams throughout the class on the Collaborative Learning Project (CLP). Teams will be formed in our first joint session. At the end of the class, the student teams will present their CLPs to the class and receive final feedback from their peers. All sessions include input from the course instructor and interactive individual/group co-working time.

Individual-based learning

- Pre-course reading and assignment
- Preparation of peer feedback
- Final quiz

Team-based learning

- Analyzing a self-defined data analytics problem
- Engaging in coaching with the instructor
- Reacting and benefiting from peer feedback

### Pre-Course Assignment

#### Preparation Task

Read Section 1 of James et al. (2013)

#### Main Task

Suggest and summarize a managerial decision-making problem for the CLP.

#### Recommended Task

Read Sections 2.1-2.2, 3.1-3.3, 4.3, 5.1, 6.2 of James et al. (2013)

### Course Contents

<b>Day 1</b>	<ul style="list-style-type: none"> <li>• Introduction               <ul style="list-style-type: none"> <li>◦ Introduction to the course structure and deliverables</li> <li>◦ Introduction to data analytics</li> <li>◦ Designing a data analysis plan</li> </ul> </li> <li>• Collaborative Learning Project kickoff session</li> </ul>
<b>Day 2</b>	<ul style="list-style-type: none"> <li>• Bounded Rationality and AI               <ul style="list-style-type: none"> <li>◦ Boundaries to rationality in human decision-making</li> <li>◦ AI as a means to overcome bounded rationality</li> </ul> </li> <li>• Machine biases</li> </ul>
<b>Day 3</b>	<ul style="list-style-type: none"> <li>• Statistical Learning I               <ul style="list-style-type: none"> <li>◦ Human vs. machine learning</li> <li>◦ Linear regression analysis</li> <li>◦ Logistic regression analysis</li> </ul> </li> <li>• Applied regression in R</li> </ul>
<b>Day 4</b>	<ul style="list-style-type: none"> <li>• Applications I               <ul style="list-style-type: none"> <li>◦ Case study "Foreign Market Selection (Pt. 1)"</li> </ul> </li> <li>• CLP feedback session</li> </ul>
<b>Day 5</b>	<ul style="list-style-type: none"> <li>• Statistical Learning II               <ul style="list-style-type: none"> <li>◦ Experiential learning by machines</li> <li>◦ Fundamentals of machine learning</li> <li>◦ Basic machine learning models</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>Applied machine learning in R</li> </ul>
<b>Day 6</b>	<ul style="list-style-type: none"> <li>Statistical Learning III <ul style="list-style-type: none"> <li>Reinforcement learning</li> <li>Complex machine learning models</li> <li>Large language models and generative AI</li> </ul> </li> <li>LLM applications with R/Python</li> </ul>
<b>Day 7</b>	<ul style="list-style-type: none"> <li>Applications II <ul style="list-style-type: none"> <li>Case study "Foreign Market Selection (Pt. 2)"</li> </ul> </li> <li>CLP presentation session</li> </ul>
<b>Day 8</b>	<ul style="list-style-type: none"> <li>Closing <ul style="list-style-type: none"> <li>Final quiz</li> </ul> </li> <li>Summary and reflection</li> </ul>

Comments
<p>The Collaborative Learning Project (CLP) is intended as an autonomous, student-focused team project. Student teams will work on a self-selected data analytics problem throughout the course. They will have time during class to develop their projects and receive feedback from the instructor and peers. Final presentations will include peer assessments.</p>

Criteria for successful completion of the course																		
<p>The final grade will be calculated according to the following formula:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Grade</th> <th style="width: 15%;">Points</th> <th style="width: 70%;">Description</th> </tr> </thead> <tbody> <tr> <td>1/A</td> <td>90+</td> <td>Exceptional, outstanding, and excellent performance. Normally achieved by a minority of students who are highly engaged in the subject matter. These grades apply to a student who is self-initiating, exceeds expectations, and has an insightful grasp of the subject matter.</td> </tr> <tr> <td>2/B</td> <td>80-89</td> <td>Very good, good, and solid performance. These grades indicate good engagement with and a good grasp of the subject matter or an excellent grasp in one or more areas balanced with a satisfactory grasp in other areas.</td> </tr> <tr> <td>3/C</td> <td>70-79</td> <td>Satisfactory. These grades indicate satisfactory engagement, performance, and knowledge of the subject matter.</td> </tr> <tr> <td>4/D</td> <td>60-69</td> <td>Marginal Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.</td> </tr> <tr> <td>Failed</td> <td>59 and below</td> <td>Unsatisfactory performance.</td> </tr> </tbody> </table>	Grade	Points	Description	1/A	90+	Exceptional, outstanding, and excellent performance. Normally achieved by a minority of students who are highly engaged in the subject matter. These grades apply to a student who is self-initiating, exceeds expectations, and has an insightful grasp of the subject matter.	2/B	80-89	Very good, good, and solid performance. These grades indicate good engagement with and a good grasp of the subject matter or an excellent grasp in one or more areas balanced with a satisfactory grasp in other areas.	3/C	70-79	Satisfactory. These grades indicate satisfactory engagement, performance, and knowledge of the subject matter.	4/D	60-69	Marginal Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.	Failed	59 and below	Unsatisfactory performance.
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Assessment
<p>Assessment will be based on both individual and team performance. The final grade consists of the following components:</p> <p>Individual-based assessment:</p> <ul style="list-style-type: none"> <li>Pre-course assignment (20%)</li> <li>Final quiz (20%)</li> <li>CLP in-group peer rating (10%)</li> <li>CLP peer feedback #1 (10%)</li> <li>CLP peer feedback #2 (10%)</li> </ul> <p>Group-based assessment:</p> <p>CLP peer review (30%)</p>

Course Literature
<p>James, G., Witten, D., Hastie, T., &amp; Tibshirani, R. (2013). An introduction to statistical learning. Available at <a href="https://www.stat.berkeley.edu/users/rabbee/s154/ISLR_First_Printing.pdf">https://www.stat.berkeley.edu/users/rabbee/s154/ISLR_First_Printing.pdf</a>. Sections 1, 2.1-2.2, 3.1-3.3, 4.3, 5.1, 6.2</p>

**Further Readings suggested by the Lecturer(s)**

Wickham, H., & Grolemund, G. (2017). R for data science. Available at: <https://r4ds.hadley.nz/>.

**Information on the Use of Artificial Intelligence Tools**

Students are explicitly encouraged to use AI tools to support their learning and creativity while critically evaluating AI-generated content for accuracy and reliability. They are reminded that using AI tools should *augment* their work, *not substitute* for it. Throughout their work, students should reflect and remain conscious of how the interaction between them and AI resulted in better outcomes.

*Please note the following information on the total workload of the respective course:*

<b>Course level</b>	<b>ECTS credits</b>	<b>Pre-course workload</b>	<b>In-class activity</b>	<b>Outside of class workload during the program</b>
Undergraduate	4	approx. 20 hours	27 hours (= 35 teaching hours)	approx. 33 hours