



# Setting up the international MSc in AI & Cybersecurity

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# In the next 15 minutes I hope to

- Give you an idea what the core values and design principles that underpin the new “MSc in AI and Cybersecurity” at AAU in Klagenfurt:
  - Big data has transformed Computer Science education internationally
  - AI techniques are fundamental to threat prediction and analysis
  - Cybersecurity is fundamental to ethical deployment of (large scale) AI
  - Fundamental skills that every student needs to have
- Explain the program structure
- Give some initial insights

# Sciences playing with data

- No single established technical discipline is a pillar for either AI or cybersecurity
  - AI and cybersecurity build on many established disciplines (but there are no students with backgrounds in everything)
  - The world with (big) data evens out the importance of “mathematical/computational thinking”, “data driven thinking”, “process driven thinking”
    - Data needs to be gathered, curated, processed, stored
    - In a manner that is at least legal, but should be also ethical, and with awareness of social implications

# AI and Cybersecurity curriculum

- Assumptions
  - No single BSc degree is an “ideal” preparation
  - There are many different roles/paths w.r.t. employment that students could take
  - Smaller employers right now don’t have an established workforce/much expertise in the intersection of those areas, thus new employees need to be adaptive and flexible in their thinking and their behaviours
- Resulting curriculum design paradigms
  - Cater for a broad intake (not just computer science students), foundations, foundations, foundations ... including those of social, ethical and legal aspects
  - Enable “easy” interaction with industry via projects
  - Model “flexibility/adaptivity: working across cultures, continuous integration of SEL aspects, student led learning

# The resulting MSc design

- **MSc degree “AI and Cybersecurity”**

- Limited to 30 students in Klagenfurt
- English language throughout, collaboration with Italian partner University
- **Competitive entry: we recruit exclusively w.r.t. potential to achieve**
- **Structured, but with some flexibility later on**

Term 1	Compulsory courses	
Term 2	Compulsory course	Elective courses/small project
Term 3	Elective courses/project	Elective courses/project
Term 4	MSc research project and thesis	

# Compulsory courses

Subject	Course Title	ECTS-AP
Foundations of AI and Cybersecurity	Fundamentals of AI and Cybersecurity	4
	Social, Ethical and Legal Aspects of AI and Cybersecurity	4
		8
Artificial Intelligence	Introduction to AI	8
	Machine Learning and Deep Learning	4
		12
Cybersecurity	Introduction to Cybersecurity	8
	<u>Verification and Validation for AI and Cybersecurity</u>	<u>12</u>
		20

# Elective courses

Subject	Course Title	ECTS-AP
Specialisation in AI and Cybersecurity	4.1 Advanced Topics in AI 1	6
	4.2 Advanced Topics in AI 2	6
	4.3 Advanced Topics in Cybersecurity 1	6
	4.4 Advanced Topics in Cybersecurity 2	6
	4.5 Small Project	12
	4.6 Large Project	24
	Any combination of LVs from the list of approved LVs which is published/updated every year	*
Responsible Innovation	<i>5.1 Communicating AI and Cybersecurity Research</i>	2
	<i>5.2 Responsible Engineering for AI and Cybersecurity</i>	6
	<i>Any combination of LVs from Gender Studies and/or Responsible Innovation</i>	*
		8

# MSc research and thesis

Subject	Course title	ECTS-AP
Thesis	6.1 Master's thesis	26
	6.2 Privatissimum	2
	6.3 Responsibility in AI & Cybersecurity: Reflecting the social and ethical dimensions in the master's thesis	2
		30

MSc: students must attend a reflective practice seminar to discuss aspects of responsible innovation with an 'external' academic and include (e.g. via an appendix) the resulting reflection into their MSc thesis (1.3 must be completed successfully prior thesis submission)

# Insights

- Programme is attractive, huge interest from varied backgrounds
  - First year: 140 applicants (recruitment only over the 3 summer months)
  - Second year: 140 applicants just in the first round, 2 more rounds to complete (we expect around 350 applications, for 30 places)
  - Applicants are from all over the world (including Eastern Europe, South East Asia, Africa, Canada, US)
- Programme was always meant to include students from partner university without mobility: hybrid delivery, extremely helpful in the pandemic
- SEL components very much appreciated by students

Thank you!

## Cybersecurity Research

<http://www.cybersecurityresearch.at/>

## MSc in Artificial Intelligence & Cybersecurity

<https://www.aau.at/en/studien/master-artificial-intelligence-and-cybersecurity/>



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