



HÁSKÓLINN Í REYKJAVÍK  
REYKJAVIK UNIVERSITY



UNIVERSITY  
OF ICELAND

# The Joint Cybersecurity Master's Programme and Cybersecurity courses offered

Information meeting for students  
Spring 2025



<https://uni.hi.is/helmut/cybersecurity/>



Co-funded by  
the European Union

# Why is cybersecurity important? or: why to study it!



- Modern society relies heavily on many online services (e-commerce and banking, health sector, transportation, communication, utilities, i.e. **critical infrastructure**).
- Ever increasing amounts of data is collected and processed by various actors (all online transactions, AI and ML, etc.).  
We need to **protect private users and companies** against data thefts and losses.  
Sensitive data should be kept safe (and yet usable for legitimate purposes).
- Securely designed systems are also a **business enabler**.  
Relevant skills are needed in designing, implementing and validating them!

# Teachers involved



- **Ásta Guðrún Helgadóttir**, **Uol**, `astagh`

- **Esa Hyytiä**, **Uol**, `esa`

Use this username for emailing.  
Email addresses at Uol end with @hi.is

- **Fatima Errounda**, **RU**, `fatima`

Use this username for emailing.  
Email addresses at RU end with @ru.is

- **Hans Reiser**, **RU**, `hansr`

- **Helmut Neukirchen**, **Uol**, `helmut`

- **Jacky Mallett**, **RU**, `jacky`

- **Tom Welsh**, **Uol**, `tomwelsh`

- + external teachers, e.g. Rey Leclerc Sveinsson & Svavar Ingi Hermannsson at Uol
- + visiting scholars (from US via Fulbright, from NTNU Norway)



- Joint programme at University of Iceland and Reykjavik University.
  - Specialisation/emphasis of the existing M.Sc. programmes in Computer Science.  
(Cysec specialisation also for M.Sc. in Software Engineering at UoI since autumn 2024.)
    - Intent: add a specialisation/emphasis of the existing M.Sc. programmes.
    - Planned to become in future a study programme on its own.
    - You can still (now or later) change over into that specialisation/emphasis.
- Taught in English to attract as many students as possible.



- Students enroll in the M.Sc. programme at the university of their choice.
  - Take “normal” M.Sc. Computer Science courses + mandatory courses specific to Cybersecurity.
  - Can take **cybersecurity-related course** from the other university as well.
    - This applies only to students who are enrolled in the cybersecurity specialisation/emphasis! (But: as long as student numbers are low, we try to get other students in as well on a best-effort basis).
    - Need to enrol as guest student at the other university: You need to refer to cysec collaboration to get fees waived.
    - Currently: Credits need to be manually registered at home university.  
(Uol: currently, course name does not show up in Uol record, but only as “credits from another university”. Get a document from RU if want to be able to show the course name.)
  - Of course, students can always take the cybersecurity courses from their own university.
- Import additional distance learning courses from abroad, e.g.:
  - Norwegian University of Science and Technology (NTNU Trondheim/Gjøvik, Norway).
  - Aalto University (Helsinki, Finland).

## ■ RU:

- First 12 weeks of parallel courses:
  - Teaching period: 13. January to 4. April,
  - Exam period: 7. April to 25. April.
- Followed by 3 weeks of a single, all-day course:

- Teaching period: 28. April to 16. May,
- Exam/assessment: 19. May or 20. May.

Source: <https://en.ru.is/studies/calendar/season-2024-2025/#tab2>

UoI students can take these 3 week courses, but have to tell RU teacher if they cannot attend on specific days due to exams at UoI.

## ■ UoI:

- Teaching period: 13. January to 15. April,
- Exam period: 22. April to 8. May.

Source: [https://www.hi.is/nam\\_verkfraedi\\_og\\_natturuvisindasvid/kennslualmanak\\_verkfraedi\\_og\\_natturuvisindasvids](https://www.hi.is/nam_verkfraedi_og_natturuvisindasvid/kennslualmanak_verkfraedi_og_natturuvisindasvids)

# Courses offered at RU (12 week + 3 week)



Vorönn/Spring 2025					
+	Business Intelligence		I-707-VGBI	ECTS 6	
+	Operating Systems		T-215-STY1	ECTS 6	
+	Engineering Optimization		T-423-ENOP	ECTS 6	
+	Programming Languages		T-501-FMAL	ECTS 6	
+	User-Centered Software Development		T-515-NOTH	ECTS 6	
+	Software Maintenance		T-533-VIHU	ECTS 6	
+	Mechatronics II		T-535-MECH	ECTS 6	
+	Design and Analysis of algorithms		T-604-HGRE	ECTS 6	
+	Artificial Intelligence		T-622-ARTI	ECTS 6	
+	Advanced Game Design & Development		T-634-AGDD	ECTS 6	
+	Game Engine Architecture		T-637-GEDE	ECTS 6	
+	Research Methodology		T-701-REM4	ECTS 8	
+	Modeling and Verification		T-707-MOVE	ECTS 8	
+	Fundamentals of Machine Learning		T-711-FOML	ECTS 8	
+	Speech Processing		T-715-SPPR	ECTS 6	
+	Empirical Research in Software Engineering, Information Systems, and Human-Computer Interaction		T-741-ERSE	ECTS 8	
+	Cyber Security Management & Compliance in Practice		T-746-COPS	ECTS 8	
+	Reverse Engineering and Malware Analysis		T-748-REMA	ECTS 6	
+	Introduction to Industrial Control security		T-749-ICIS	ECTS 8	
+	Autonomous Robotics		T-756-AUTO	ECTS 8	
+	Big Data Management		T-764-DATA	ECTS 8	
+	Applied Data Science		T-786-APDS	ECTS 6	
+	MSc Thesis (30 ECTS)		T-810-MTPR	ECTS 24	
+	Creating a Complete Business Plan for a Technical Idea - Entrepreneurship and the Innovation Process		T-814-INNO	ECTS 8	
+	Deep Learning		T-820-DEEP	ECTS 8	
+	MSc Thesis Defence (30 ECTS)		T-820-MDPR	ECTS 6	
+	MSc Thesis - Part I		T-830-MSTR	ECTS 30	
+	MSc Thesis - Part II		T-835-MTRH	ECTS 24	
+	MSc Thesis Defence (60 ECTS)		T-840-MDRS	ECTS 6	
+	Entrepreneurial Finance		V-733-ENTR	ECTS 7,5	
+	Entrepreneurship and Starting New Ventures		X-204-STOF	ECTS 6	

**Legend**

- Mandatory course on major Teaching language
- Optional course on major Prerequisites for course

Autumn planning: work-in-progress – more courses to be added.

Haustönn/Fall 2025					
+	Computer Security: Defence Against the Dark Arts		T-742-CSDA	ECTS 8	
+	MSc Thesis (30 ECTS)		T-810-MTPR	ECTS 24	
+	MSc Thesis Defence (30 ECTS)		T-820-MDPR	ECTS 6	
+	MSc Thesis - Part I		T-830-MSTR	ECTS 30	
+	MSc Thesis - Part II		T-835-MTRH	ECTS 24	
+	MSc Thesis Defence (60 ECTS)		T-840-MDRS	ECTS 6	



- 12-week course (starting Jan 13):
- T-746-COPS **Cyber Security Management & Compliance in Practice**
  - 8 ECTS, M.Sc./3rd year B.Sc.,
  -
- T-749-ICIS **Introduction to Industrial Control security**
  - 8 ECTS, M.Sc./B.Sc. with at least 120 ECTS
  -
- 3-week course (starting Apr 28):
- T-748-REMA **Reverse Engineering and Malware Analysis**
  - 6 ECTS, M.Sc.
- **M.Sc. thesis**
  - Computer Science: 1 or 2 semesters duration (30 or 60 ECTS). Needs to be about a CS CySec topic.
  - Software Engineering: 2 semesters duration (60 ECTS). Needs to be about a SE CySec topic.



## Specialisation: Cyber Security (Courses in 2024-2025)

### Year of study unspecified

Fall	Spring
<ul style="list-style-type: none"> <li>⑤ HBV506M Secure Software Engineering 🇫🇮 🇫🇮 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL029M Introduction to Information Security 🇬🇧 📍 6e</li> <li>⑤ TÖL104M Network Measurements and Analysis 🇫🇮 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL431L Final project 🇫🇮 🇫🇮 📎 30e 🕒</li> <li>⑤ TÖL503M Distributed Systems 🇫🇮 🇫🇮 🇬🇧 📍 ⚠️ 6e</li> <li>⑤ HBV507M Usable Privacy and Security 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL113F Quantum Cryptography 🇫🇮 🇬🇧 🚫 📍 6e</li> <li>⑤ IDN113F Time Series Analysis 🇫🇮 🇬🇧 🌐 📎 7,5e</li> <li>⑤ REI503M Performance analysis of computer systems 🇫🇮 🇫🇮 🇬🇧 📍 ⚠️ 6e</li> <li>⑤ REI504M Cloud Computing and Big Data 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ REI505M Machine Learning 🇫🇮 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL022F Internship in Cybersecurity 🇬🇧 📍 6e</li> <li>⑤ TÖL103M Programming Projects on Internet of Things 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL506M Introduction to deep neural networks 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ VON001F Thesis skills: project management, writing skills and presentation 🇬🇧 📍 🖨️ 4e</li> </ul>	<ul style="list-style-type: none"> <li>⑤ TÖL213M Applied Cryptography 🇫🇮 🇫🇮 🇬🇧 📍 6e</li> <li>⑤ TÖL605M Fundamentals of Ethical Hacking 🇫🇮 🇬🇧 📍 4e</li> <li>⑤ TÖL204F Seminar for MS-Students 🇬🇧 📍 2e</li> <li>⑤ TÖL431L Final project 🇫🇮 🇫🇮 📎 30e 🕒</li> <li>⑤ TÖL212F Governance of the Internet 🇬🇧 📍 6e</li> <li>⑤ RAF617M Fundaments of the Internet 🇬🇧 📍 6e 🚫</li> <li>⑤ HBV205M Software Testing 🇫🇮 🇫🇮 🇬🇧 📍 ⚠️ 6e</li> <li>⑤ LÖG283F Privacy and Data Protection Law 📅 🇫🇮 🇬🇧 🚫 📍 6e</li> <li>⑤ RAF620M Introduction to machine learning and artificial intelligence 🇫🇮 📍 6e</li> <li>⑤ TÖL022F Internship in Cybersecurity 🇬🇧 📍 6e</li> <li>⑤ TÖL213M Applied Cryptography 🇫🇮 🇫🇮 🇬🇧 📍 6e</li> </ul> <p>Note: TÖL113F Quantum cryptography will be in autumn (was shown for spring 2025 in the Software Engineering version of the course catalogue)</p>

Fall 2024 shown above. Fall 2025 will be similar with some changes, though.

Course catalogue Computer Science M.Sc.: [https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080705\\_20246&kennsluar=2024&lina=10545](https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080705_20246&kennsluar=2024&lina=10545)

Course catalogue Software Engineering M.Sc.: [https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080725\\_20246&kennsluar=2024&lina=10547](https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080725_20246&kennsluar=2024&lina=10547)



TÖL=Computer Science topic / HBV=Software Engineering topic  
M = M.Sc. students and 3rd year B.Sc. students, F = M.Sc. only

- TÖL605M **Fundamentals of Ethical hacking**
  - 6 ECTS, mandatory for UoI CySec students.
  - This course (or an RU course covering penetration testing) is a prerequisite for the autumn course HBV506M Secure Software Engineering (that is mandatory for UoI CySec specialisation).
- TÖL213M **Applied Cryptography**
  - 6 ECTS, mandatory for UoI CySec students.
- TÖL212F **Governance of the Internet**
  - 6 ECTS, mandatory for UoI Computer Science (elective for others, such as SE) CySec students.
- HBV205M **Software Testing**
  - 6 ECTS, elective for M.Sc. Computer Science, mandatory M.Sc. for Software Engineering.
- **M.Sc. thesis**
  - Computer Science: 1 or 2 semesters duration (30 or 60 ECTS). Needs to be about a CS CySec topic.
  - Software Engineering: 2 semesters duration (60 ECTS). Needs to be about a SE CySec topic.

- Check course catalogue of the two universities:
  - See URLs on slides 7 and 9.
- For particular questions, contact your university's staff or course teachers
  - (For email addresses: see slide 3).
- If you want to take a course at the other university:
  - RU student taking course at UoI: contact Helmut at UoI.
  - UoI student taking course at RU: contact Jacky at RU.

# ICANN DNSSEC training

## 4th and 5th of February



- **ICANN** (the organisation that decided that there is an **.is** top-level domain) will host a **technical training on DNSSEC in February**.
  - DNSSEC uses cryptography to guarantee that not everyone can fake an answer to a request to resolve, e.g. **island.is**, to an IP address – but only the authoritative owner of that domain.
  - This training is for everyone who now or in future is in charge of a domain and wants to use DNSSEC to secure the address resolution of that domain.
- **Dates: 4th and 5th of February 2025.**
  - *“It was really interesting to see everything that goes into securing the DNS. Really good training with talented experts! Highly recommend going!”* - Kristófer Finnsson, MSc student in Cybersecurity.
  - **Limited space available for students (as it is also open for industry people).**
  - **More information and registration here:**  
<https://www.icann.org/en/engagement-calendar/details/dnssec-training-at-iceland-university-2025-02-04>

### DNSSEC námskeið - DNSSEC Training



Registration QR code

- Download these slides: via QR code or <https://uni.hi.is/helmut/cybersecurity/>
  - Still possible to register for courses!
- ICANN DNSSEC training in Iceland:
  - 4th and 5th of February 2025,
  - Free (as in free beer), but limited space and registration required.
- Questions? / Comments?
- Pizza!
- Next: Cyberclub!



- The joint cybersecurity study offerings would not be possible without funding by
  - the [Ministry of Higher Education, Science and Innovation](#),
  - the [European Union's Digital Europe Programme](#).
    - European Cybersecurity Competence Centre and Network (ECCC)  
<https://cybersecurity-centre.europa.eu>
      - The ECCC aims to increase Europe's cybersecurity capacities and competitiveness,
      - working together with a Network of National Coordination Centres (NCCs) to build a strong cybersecurity community.
        - In Iceland, this is Eyvör, the National Cybersecurity Coordination Centre of Iceland (NCC-IS) <https://eyvor.is>