HÁSKÓLINN Í REYKJAVÍK
REYKJAVIK UNIVERSITY

UNIVERSITY OF ICELAND

The New Joint Cybersecurity Master's Programme

Information meeting for students Fall 2023

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

Persons involved

- Jacky Mallett, RU, jacky ⟵   Use this user name for emailing.
  Email addresses at RU end with @ru.is

- Hans Reiser, RU, hansr

- Esa Hyytiä, UoI, esa ⟵   Use this user name for emailing.
  Email addresses at UoI end with @hi.is

- Matthias Book, UoI, book

       +   visiting professors and guest teachers!

- Helmut Neukirchen, UoI, helmut

- Tom Welsh, UoI, starting 10/2023

Joint master's programme in cybersecurity

- Joint programme at University of Iceland and Reykjavik University.

  - New specialisation/emphasis of the existing M.Sc. programmes in Computer Science (not: SE).

    - Might in future become a study programme on its own.

    - You can still (now or later) change over into that specialisation/emphasis

- Start: Autumn 2023.

- Taught in English to attract as many students as possible.

How does it work?

- Students enroll in the Computer Science M.Sc. programme at the university of their choice.
  - Take "normal" M.Sc. Computer Science courses + mandatory courses specific to Cybersecurity.

  - Can take course from the other university as well (up to 50 ECTS units out of 120 ECTS units).
    - Contracts to enable this currently in the quantum spacetime between ministry and rectors.
      - Until that contract is in place: informal participation in courses possible.
    - **This applies only to students who are enrolled in the cybersecurity specialisation/emphasis**!
      - Other students (CS, SE, etc. B.Sc., M.Sc.) can still 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).
      - As long as student numbers are low, it should be possible that also students who are not in the specialisation/emphasis take these courses.

Curriculum (Example)

- 1st semester:
  - Introduction to Information Security (Management) (Reykjavik University, University of Iceland)
  - Network Measurements and Analysis (University of Iceland),
  - Machine Learning in Cybersecurity (Reykjavik University),
  - Lectures from practitioners and from abroad.
    - E.g. Socio-technical Enabled Crime (NTNU).
- 2nd semester:
  - Cyber Defence (Reykjavik University), Applied Cryptography (University of Iceland)
  - Privacy and Data Protection Law (University of Iceland, in Icelandic),
  - Introduction to Digital Forensics (Reykjavik University)
  - Lectures from practitioners and from abroad.
    - E.g. Reverse Engineering and Malware Analysis (NTNU).
- 3rd semester:
  - Quantum Cryptography (University of Iceland)
  - Cyber Range Lab (both universities together),
  - Lectures from practitioners and from abroad.
    - E.g. Critical Infrastructure Security (NTNU), Internships.
- 4th semester: M.Sc. thesis (2 semester thesis possible as well)

+ non-cybersecurity computer science courses (e.g. artificial intelligence, cloud computing, distributed systems, software testing, software quality management, research methodology)

Courses offered at UoI

Specialisation: Cyber Security (Courses in 2023-2024)

Year of study unspecified	
Fall	Spring
Ⓢ TÖL029M Introduction to Information Security 🇬🇧 📍 6e	Ⓢ TÖL204F Seminar for MS-Students 🇮🇸 📍 2e
Ⓢ TÖL104M Network Measurements and Analysis 🚩 🏴 🇬🇧 📍 6e	Ⓢ TÖL431L Final project 🇮🇸🇬🇧 ⚓ 30e
Ⓢ TÖL113F Quantum Cryptography 🚩 🇬🇧 ⊘ 📍 6e	Ⓥ HBV204M Software Quality Management 🚩 🏴 🇬🇧 📍 ⚠ 6e
Ⓢ TÖL431L Final project 🇮🇸🇬🇧 ⚓ 30e	Ⓥ HBV205M Software Testing 🚩 🏴 🇬🇧 ⊘ 📍 ⚠ 6e
Ⓥ IÐN113F Time Series Analysis 🚩 🇬🇧 ⊘ 🌐 📖 7,5e	Ⓥ LÖG283F Privacy and Data Protection Law 📅 🚩 🇮🇸 📍 6e
Ⓥ REI503M Performance analysis of computer systems 🚩 🏴 🇬🇧 ⊘ 📍 ⚠ 6e	Ⓥ RAF620M Introduction to machine learning and artificial intelligence 🚩 🇮🇸 📍 6e
Ⓥ REI504M Cloud Computing and Big Data 🚩 🇬🇧 ⊘ 📍 6e	Ⓥ TÖL022F Internship in Cybersecurity 🇬🇧 📍 6e
Ⓥ REI505M Machine Learning 🚩 🏴 🇬🇧 📍 6e	Ⓥ TÖL213M Applied Cryptography 🚩 🏴 🇬🇧 📍 6e
Ⓥ TÖL022F Internship in Cybersecurity 🇬🇧 📍 6e	Ⓥ TÖL603M Security Analytics 🚩 🇬🇧 📍 6e
Ⓥ TÖL103M Programming Projects on Internet of Things 🚩 🇬🇧 📍 6e	
Ⓥ TÖL106M Security Engineering for Critical Information Infrastructures 🇬🇧 📍 6e	
Ⓥ TÖL107M Cyber Conflicts, Cyber Security Threats and Engineering, National Information Infrastructures (NII) 🇬🇧 📍 6e	
Ⓥ TÖL503M Distributed Systems 🚩 🏴 🇬🇧 ⊘ 📍 ⚠ 6e	
Ⓥ TÖL506M Introduction to deep neural networks 🚩 🇮🇸 📍 6e	
Ⓥ VON001F Thesis skills: project management, writing skills and presentation 🇬🇧 📍 💻 4e	
Fall and Spring (whole year courses)	
Ⓥ GKY001M Mentor in Sprettur 🚩 🇮🇸 📍 👥 5e	
Students can choose other unlisted electives with the approval of the Chair of the Department or the Supervisor of Teaching before signing up for the course.	

https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080705_20236&kennsluar=2023&lina=10233

Courses offered at RU (12 week + 3 week)

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Legend

Symbol	Meaning	Symbol	Meaning
✓	Mandatory course on major	🇮🇸	Teaching language
⊕	Optional course on major	⬆	Prerequisites for course

Haustönn/Fall 2023

Course			Code	ECTS	Lang
Mathematical Programming	⬆	⊕	E-402-STFO	ECTS 6	🇬🇧
Operation Research	⬆	⊕	T-403-ADGE	ECTS 6	🇮🇸
Effective Programming and Problem Solving	⬆	⊕	T-414-AFLV	ECTS 6	🇮🇸
Computer Security	⬆	⊕	T-417-TOOR	ECTS 6	🇮🇸
Simulation	⬆	⊕	T-502-HERM	ECTS 6	🇮🇸
Introduction to Machine Learning	⬆	⊕	T-504-ITML	ECTS 6	🇬🇧
Computer Graphics	⬆	⊕	T-511-TGRA	ECTS 6	🇬🇧
Theory of Computation	⬆	⊕	T-519-STOR	ECTS 6	🇬🇧
Cyber Physical Systems	⬆	⊕	T-535-CPSY	ECTS 6	🇬🇧
Compilers	⬆	⊕	T-603-THYD	ECTS 6	🇬🇧
Computer Game Design & Development	⬆	⊕	T-624-CGDD	ECTS 6	🇮🇸
Software Engineering II - Testing	⬆	⊕	T-631-SOE2	ECTS 6	🇮🇸
Digital Health		⊕	T-702-MDGH	ECTS 8	🇬🇧
Applied Statistics for Data Science		⊕	T-705-ASDS	ECTS 8	🇬🇧
Machine Learning in Cyber Security		⊕	T-710-MLCS	ECTS 8	🇬🇧
Applications of Digital Health		⊕	T-712-MADH	ECTS 8	🇬🇧
Empirical Reasoning Systems		✓	T-713-MERS	ECTS 8	🇬🇧
Virtual Environments	⬆	⊕	T-723-VIEN	ECTS 8	🇬🇧
Natural Language Processing		⊕	T-725-MALV	ECTS 8	🇬🇧
Introduction to Embedded Systems and the Internet of Things	⬆	⊕	T-732-ISIT	ECTS 6	🇬🇧
Software Project Management		✓	T-740-SPMM	ECTS 8	🇬🇧

Course			Code	ECTS	Lang
AI Seminar		⊕	T-744-AISE	ECTS 2	🇬🇧
Cyber Security Seminar		⊕	T-745-CSSS	ECTS 2	🇬🇧
Reinforcement Learning		⊕	T-747-RELE	ECTS 8	🇬🇧
Independent Study 1		⊕	T-749-INDS	ECTS 6	🇬🇧
Informed Search Methods in AI		⊕	T-768-SMAI	ECTS 8	🇬🇧
T-MSc-three week		⊕	T-777-BLMR	ECTS 6	🇬🇧
Applied Data Science	⬆	⊕	T-786-APDS	ECTS 6	🇬🇧
Data Mining and Machine Learning		⊕	T-809-DATA	ECTS 8	🇬🇧
Optimization Methods	⬆	⊕	T-810-OPTI	ECTS 8	🇬🇧
Applied Probability	⬆	⊕	T-811-PROB	ECTS 8	🇬🇧
Managing Research and Development - Methods and Models		⊕	T-814-PROD	ECTS 8	🇬🇧
MSc Research		⊕	T-879-MSRS	ECTS 30	🇬🇧
MSc Thesis Defense		✓	T-891-MSTD	ECTS 6	🇬🇧
MS Thesis		✓	T-899-MSTH	ECTS 30	🇬🇧
Thesis Project Defense		⊕	T-991-TPDE	ECTS 6	🇬🇧
Exchange Studies		⊕	X-699-EXCH	ECTS 30	🇮🇸

+ 3-week course (6 ECTS) in collaboration with Syndi (RU's 3 week courses are in December, i.e. during UoI exam period).

Vorönn/Spring 2024

Course			Code	ECTS	Lang
Engineering Optimization	⬆	⊕	T-423-ENOP	ECTS 6	🇬🇧
Mechatronics II	⬆	⊕	T-535-MECH	ECTS 6	🇬🇧
Modeling and Verification	⬆	⊕	T-707-MOVE	ECTS 8	🇬🇧
Creating a Complete Business Plan for a Technical Idea - Entrepreneurship and the Innovation Process		⊕	T-814-INNO	ECTS 8	🇬🇧
MS Thesis		✓	T-899-MSTH	ECTS 30	🇬🇧
Entrepreneurial Finance		⊕	V-733-ENTR	ECTS 7,5	🇬🇧
Exchange Studies		⊕	X-699-EXCH	ECTS 30	🇮🇸

Cybersecurity MSc Programme

https://en.ru.is/course-catalogue/

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Distance teaching courses offered from abroad

- NTNU (Norway, Gjøvik campus): Autumn 2023

  - Critical Infrastructure Security (15 week course)

  - Malware Analysis (3 week course: November 21st - December 9th)

- Contact Jacky how to join these courses.

Summary

- Check course catalogue of the two universities:
  - UoI: https://ugla.hi.is/kennsluskra/index.php?tab=nam&chapter=namsleid&id=080705_20236&kennsluar=2023&lina=10233
  - RU: https://en.ru.is/course-catalogue/

- Contact your university's staff (slide 2).

- Download these slides: via QR code
  - or: https://uni.hi.is/helmut/cybersecurity/

- Questions? / Comments?