### Specialization Software Technology

**Mandatory Core (20 EC)**
- Design of Software Architectures 1
- Software Testing and Risk Assessment 3
- Software Engineering Techniques (previously PPPP) 4
- System Validation 1

**Advanced (at least 4)**
- Advanced Logic 4
- Graph Algorithms and Complexity 2
- Software Management 4
- Interactive Theorem Proving 2
- ADSA-Model driven engineering 1
- Service-oriented Architecture with Web Services 3
- Modeling and Analysis of Concurrent Systems 1
- Software Evolution 3
- Quantitative evaluation of Systems 3

**Design Orientation (10 EC)**
- Industrial Software Engineering project

**Research Orientation (10 EC)**
- Software Science (13, 14, 15, 16) 3, 4
- Capita selecta ST 1

**Specialization Cyber Security**

**Mandatory Core (20 EC)**
- Internet security 3
- Software Security 2
- Security & Cryptography** 1
- Cyber risk management** 1

**Advanced (at least 4)**
- Secure Data Management 1
- Secure Cloud Computing 1
- Security Services for IoT 4
- Security Verification Year
- System Security 4
- System Validation 1
- Cyber Data Analytics** 4
- Privacy Enhancing Tech. Bootcamp** (previously Q4) 2
- Intr. to Biometrics 2
- Blockchain and distr. ledger techn 3
- Emp. Security Analysis & Eng. (cancelled) 2
- E-Law 4
- Cyber security management 2

*Previous cohorts can find their programme at [www.4tu.nl/cybscc](www.4tu.nl/cybscc)*

**Specialization Data Science and Technology and Sport Data Science**

**Mandatory Core (20 EC) DST & SDS**
- Managing big data 2
- Data science 2, 3
- Machine learning 1 1
- Information theory and statistics 3

**Advanced (at least 4)**
- Machine Learning 2 2
- Foundations of IR or Natural Language Processing 1
- Image Processing and Computer Vision 1
- Deep Learning – theory to practice 2
- DST Architectures of IS 4
- DST Probabilistic programming 3
- SDS Adv. Techniques for Signal Analysis 3
- SDS Time Series Analysis 4
- SDS Sports Interaction Technology 4
- SDS Data Science add. topics 2, 3

**SDS profiling courses: at least 27 EC**


### Specialization Internet Science and Technology

**Mandatory Core (20 EC)**
- Internet security 3
- Performance evaluation 2
- Mobile and wireless networking 3
- Internet of Things 1

**Advanced (at least 4)**
- Advanced Networking 1
- Service-oriented Architecture with Web services 3
- Cloud Networking 2
- Ad-Hoc Networks 4
- Internet Measurements 4
- Pervasive Computing 3
- Distributed Systems 4
- Security Services for IoT 4
- Empirical Security Analysis and Engineering (cancelled) 2
- Dependable Networking Year

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**2023-2024: Computer Science GENERAL**

- **CS Core:** [Computer Ethics](#) (SEC, 1B)
- **Core Specialization Courses (20 EC):** 4 mandatory courses
- **Advanced Specialization Courses (at least 20 EC):** Choice 4 out of
- **Profiling Space (±/- 0-35 EC):** More specialization courses, or electives from other CS specializations or related Master’s programmes (EE, EMSYS, BIT, ITECH, AM, ROB), Internship, Exchange.

*Note.* Some specializations have additional requirements, e.g. ST orientation, SDS profile.

**Note!** This is a simplified overview. For a more complete overview and info on additional courses/electives, EIT Digital and requirements:

- **Quarterly courses:** 1 (Sep-Nov), 2 (Nov-Feb), 3 (Feb-Apr), 4 (Apr-Jul); Year = can be started anywhere during the year; Sem = runs over a semester.