

Exclosure to Subject Specific Regulations  
 from 25.07.2018  
 for Master-Programme  
 Information and Communication Systems  
 at TUHH  
 Programme Director: Prof. Riccardo  
 Scandariato

# Course Scheme Master Information and Communication Systems (IMPICS)

Consolidated Version  
 for Study Cohort: WiSe21/22  
 en\_head\_sda  
 and Approval of Chair from:  
 09.03.2022  
 In Force on: 01.10.2021  
 Out of Force on: 30.09.2024

Total: 120 CP

Number of Specialisations to choose: 1

Information regarding the lectures are available in the TUHH modul manuals as well as in the course catalogue.

| Module  |   |          |                      |           |          |           | Examination |  |                     | Course Work |                  |              |
|---|---|----------|----------------------|-----------|----------|-----------|-------------|--|---------------------|-------------|------------------|--------------|
| Re-com. Term  | Module Name (German / English)  | Language | ModuleResponsability | Institute | C/EC (1) | CM/OM (2) | CP (4)      | Grade  | Examination Form(3) | Compulsory  | Course Work Type | Bonus (in %) |
| <b>Core Qualification</b> Compulsory Courses: 48 LP Optional Courses: 0 LP  |   |          |                      |           |          |           |             |  |                     |             |                  |              |
| 2   | Informationstheorie und Codierung / Information Theory and Coding   | DE / EN  | Prof. Bauch          | E-8       | C        | CM        | 6           | Y  | KL                  |             |                  |              |
| 2   | Technischer Ergänzungskurs für IMPICS (laut FSPO) / Technical Complementary Course for IMPICS (according to Subject Specific Regulations) |          | Prof. Timm-Giel      | E-4       | C        | OM        | 12          | according to Subject Specific Regulations      |                     |             |                  |              |
| 3   | Forschungsprojekt und Seminar / Research Project and Seminar  | DE / EN  | Prof. Zimmermann     | SD-E      | C        | CM        | 18          | Y  | STA                 |             |                  |              |
| 1-3   | Betrieb & Management / Business & Management  | DE / EN  | Prof. Meyer          | W-1       | C        | OM        | 6           | Selection out of seperatly published Catalogue |                     |             |                  |              |
| 1-3   | Nichttechnische Angebote im Master / Non-technical Courses for Master   | DE / EN  | Richter              | 0-TUHH    | C        | OM        | 6           | Selection out of seperatly published Catalogue |                     |             |                  |              |
| <b>Specialisation Communication Systems</b> Compulsory Courses: 6 LP Optional Courses: 12 LP Number of Focuses to choose: 2 |   |          |                      |           |          |           |             |  |                     |             |                  |              |
| 1   | Digitale Nachrichtenübertragung / Digital Communications  | DE / EN  | Prof. Bauch          | E-8       | C        | CM        | 6           | Y  | KL                  | Y           | SA               | 0            |
| 1   | Hochfrequenztechnik / Microwave Engineering   | DE / EN  | Prof. Kölpin         | E-3       | EC       | CM        | 6           | Y  | KL                  | Y           | FFST             | 0            |
| 1   | Kommunikationsnetze / Communication Networks  | EN       | Prof. Timm-Giel      | E-4       | EC       | CM        | 6           | Y  | RE                  |             |                  |              |
| 1   | Moderne Funkssysteme / Modern Wireless Systems  | EN       | Dr. Grünheid         | E-8       | EC       | CM        | 6           | Y  | MP                  | Y           | FFST             | 0            |
| 2   | Simulation von Kommunikationsnetzen / Simulation of Communication Networks  | EN       | Prof. Timm-Giel      | E-4       | EC       | CM        | 6           | Y  | MP                  |             |                  |              |
| 2   | Weiterführende Konzepte der drahtlosen Kommunikation / Advanced Concepts of Wireless Communications                                       | EN       | Dr. Grünheid         | E-8       | EC       | CM        | 6           | Y  | KL                  |             |                  |              |

|  |   | Module   |                      |           |          |           | Examination |       |                     | Course Work |                  |              |
|--|---|----------|----------------------|-----------|----------|-----------|-------------|-------|---------------------|-------------|------------------|--------------|
| Re-com. Term   | Module Name (German / English)  | Language | ModuleResponsability | Institute | C/EC (1) | CM/OM (2) | CP (4)      | Grade | Examination Form(3) | Compulsory  | Course Work Type | Bonus (in %) |
| <b>Focus Software</b> Compulsory Courses: 0 LP Optional Courses: 12 LP   |   |          |                      |           |          |           |             |       |                     |             |                  |              |
| 1  | Softwareanalyse / Software Analysis   | EN       | Prof. Schupp         | E-16      | EC       | CM        | 6           | Y     | FFA                 |             |                  |              |
| 1  | Softwareverifikation / Software Verification  | EN       | Prof. Schupp         | E-16      | EC       | CM        | 6           | Y     | KL                  | Y           | ÜA               | 15           |
| 2  | Advanced Internet Computing / Advanced Internet Computing                                       | EN       | Prof. Schulte        | E-19      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Entwicklung von sicherer Software / Secure Software Engineering                                 | EN       | Prof. Scandariato    | E-22      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Modellprüfung - Beweiser und Algorithmen / Model Checking - Proof Engines and Algorithms        | DE / EN  | Prof. Fey            | E-13      | EC       | CM        | 6           | Y     | MP                  | Y           | FFST             | 0            |
| 2  | Software für Eingebettete Systeme / Software for Embedded Systems                               | DE / EN  | Prof. Renner         | E-24      | EC       | CM        | 6           | Y     | KL                  | N           | TE               | 10           |
| 2  | Softwaretesten / Software Testing   | EN       | Prof. Schupp         | E-16      | EC       | CM        | 6           | Y     | FFA                 |             |                  |              |
| <b>Focus Signal Processing</b> Compulsory Courses: 0 LP Optional Courses: 12 LP  |   |          |                      |           |          |           |             |       |                     |             |                  |              |
| 1  | Digitale Audiosignalverarbeitung / Digital Audio Signal Processing                              | EN       | Prof. Zölzer         | E-8       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 1  | Digitale Bildanalyse / Digital Image Analysis   | EN       | Prof. Grigat         | E-2       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 1  | Digitale Signalverarbeitung und Digitale Filter / Digital Signal Processing and Digital Filters | EN       | Prof. Bauch          | E-8       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Computer-Grafik / Computer Graphics   | EN       | Prof. Knopp          | E-5       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Prozessbildgebung / Process Imaging   | EN       | Prof. Penn           | V-10      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Satellitenkommunikation und Navigation / Satellite Communications and Navigation                | EN       | Prof. Bauch          | E-8       | EC       | CM        | 6           | Y     | MP                  |             |                  |              |
| 3  | Bildverarbeitung / Image Processing   | DE / EN  | Prof. Knopp          | E-5       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| <b>Specialisation Secure and Dependable IT Systems</b> Compulsory Courses: 6 LP Optional Courses: 12 LP Number of Focuses to choose: 2 |   |          |                      |           |          |           |             |       |                     |             |                  |              |
| 1  | Softwareverifikation / Software Verification  | EN       | Prof. Schupp         | E-16      | C        | CM        | 6           | Y     | KL                  | Y           | ÜA               | 15           |
| 1  | Software-Sicherheit / Software Security   | EN       | Prof. Scandariato    | E-22      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Entwurf von Dependable Systems / Design of Dependable Systems                                   | DE / EN  | Prof. Fey            | E-13      | EC       | CM        | 6           | Y     | MP                  | Y           | FFST             | 0            |
| 2  | Modellprüfung - Beweiser und Algorithmen / Model Checking - Proof Engines and Algorithms        | DE / EN  | Prof. Fey            | E-13      | EC       | CM        | 6           | Y     | MP                  | Y           | FFST             | 0            |
| <b>Focus Networks</b> Compulsory Courses: 0 LP Optional Courses: 12 LP   |   |          |                      |           |          |           |             |       |                     |             |                  |              |
| 1  | Digitale Nachrichtenübertragung / Digital Communications  | DE / EN  | Prof. Bauch          | E-8       | EC       | CM        | 6           | Y     | KL                  | Y           | SA               | 0            |
| 1  | Kommunikationsnetze / Communication Networks  | EN       | Prof. Timm-Giel      | E-4       | EC       | CM        | 6           | Y     | RE                  |             |                  |              |

|  |  | Module   |                      |           |          |           | Examination |       |                     | Course Work |                  |              |
|--|--|----------|----------------------|-----------|----------|-----------|-------------|-------|---------------------|-------------|------------------|--------------|
| Re-com. Term   | Module Name (German / English)   | Language | ModuleResponsability | Institute | C/EC (1) | CM/OM (2) | CP (4)      | Grade | Examination Form(3) | Compulsory  | Course Work Type | Bonus (in %) |
| 2  | Advanced Internet Computing / Advanced Internet Computing                        | EN       | Prof. Schulte        | E-19      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Simulation von Kommunikationsnetzen / Simulation of Communication Networks       | EN       | Prof. Timm-Giel      | E-4       | EC       | CM        | 6           | Y     | MP                  |             |                  |              |
| 3  | Traffic Engineering / Traffic Engineering  | EN       | Prof. Timm-Giel      | E-4       | EC       | CM        | 6           | Y     | MP                  |             |                  |              |
| <b>Focus Software and Signal Processing</b> Compulsory Courses: 0 LP Optional Courses: 12 LP |  |          |                      |           |          |           |             |       |                     |             |                  |              |
| 1  | Digitale Audiosignalverarbeitung / Digital Audio Signal Processing               | EN       | Prof. Zölzer         | E-8       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 1  | Digitale Bildanalyse / Digital Image Analysis                                    | EN       | Prof. Grigat         | E-2       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 1  | Softwareanalyse / Software Analysis  | EN       | Prof. Schupp         | E-16      | EC       | CM        | 6           | Y     | FFA                 |             |                  |              |
| 2  | Computer-Grafik / Computer Graphics  | EN       | Prof. Knopp          | E-5       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Entwicklung von sicherer Software / Secure Software Engineering                  | EN       | Prof. Scandariato    | E-22      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 2  | Satellitenkommunikation und Navigation / Satellite Communications and Navigation | EN       | Prof. Bauch          | E-8       | EC       | CM        | 6           | Y     | MP                  |             |                  |              |
| 2  | Softwaretesten / Software Testing  | EN       | Prof. Schupp         | E-16      | EC       | CM        | 6           | Y     | FFA                 |             |                  |              |
| 3  | Bildverarbeitung / Image Processing  | DE / EN  | Prof. Knopp          | E-5       | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| 3  | Sicherheit von Cyber-physischen Systemen / Security of Cyber-Physical Systems    | EN       | Prof. Fröschle       | E-15      | EC       | CM        | 6           | Y     | KL                  |             |                  |              |
| <b>Thesis</b> Compulsory Courses: 30 LP Optional Courses: 0 LP                               |  |          |                      |           |          |           |             |       |                     |             |                  |              |
| 4  | Masterarbeit / Master Thesis   |          | Professoren der TUHH | 0-TUHH    | C        | CM        | 30          | Y     | AB                  |             |                  |              |

#### Explanation:

<sup>1</sup>C=Compulsory, EC=Elective Compulsory

<sup>2</sup>CM=Compulsory Defined Module, OM=Optional Defined Module

<sup>3</sup>KL=Written exam, SA=Written elaboration, FFA=Subject theoretical and practical work, FFST=Subject theoretical and practical work, MP=Oral exam, RE=Presentation, STA=Study work, ÜA=Exercises, AB=Thesis, SA It.

<sup>4</sup>PRO=Written elaboration (accord. to Internship Regulations), TE=Attestation

<sup>4</sup>CP=Credit Points

<sup>5</sup>VL=Lecture, SE=Seminar, GÜ=Recitation Section (small), PBL=Project-/problem-based Learning, PR=Practical Course, PK=Projection Course, HÜ=Recitation Section (large)

<sup>6</sup>DE=German, EN=English, DE/EN=German and English

<sup>7</sup>SWS=Contact hours