

| Subject  |   | Language | Eligible@TUBS | Excluded@TUBS | Eligible@UB | Excluded@UB |
|--|---|----------|---------------|---------------|-------------|-------------|
| For TUBS-students: Yellow fields for Students of Computer and Communications System Engineering (IST) only |   |          |               |               |             |             |
| Semester 7   | <b>Information system</b>                             |          |               |               |             |             |
|  | Introduction to cyber security                        | ENG/FR   | x             |               | X           |             |
|  | Database design and analysis                          | ENG/FR   | x             |               | X           |             |
|  | Information system and data security                  | ENG/FR   | x             |               | X           |             |
|  | <b>Programming</b>                                    |          |               |               |             |             |
|  | XML technology  |          | x             |               | X           |             |
|  | OOP: API and Tools                                    |          | x             |               | X           |             |
|  | Network, concurrent and distributed programming       |          | x             |               | X           |             |
|  | <b>Software methodology</b>                           |          |               |               |             |             |
|  | Software development methodology                      |          | X             |               | X           |             |
|  | Software Testing and Quality Assurance                |          | x             |               | X           |             |
|  | Multi-agent system                                    |          | x             |               | X           |             |
|  | <b>Artificial intelligence and Virtual Reality</b>    |          |               |               |             |             |
|  | Artificial Intelligence                               | ENG/FR   | x             |               | X           |             |
|  | immersive environment and Virtual reality             | ENG/FR   | x             |               | X           |             |
|  | <b>Electronic systems, sensors, signal processing</b> |          |               |               |             |             |
| Sem. 8 - ASTRE   | Sensors and actuators                                 |          | x             |               | X           |             |
|  | Analogue electronics                                  |          |               | x             |             | X           |
|  | Signal processing (DSP)                               |          |               | x             |             | X           |
|  | Digital image processing (GPU)                        |          | x             |               | X           |             |
|  | Industry 4.0  |          | x             |               | X           |             |
|  | Embedded control system                               |          | x             |               | x           |             |

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| Sem. 9 - ASTRE   | Embedded programming                      |          | x             |               | X           |             |
|  | Real-Time Digital Signal Processors       |          | x             |               | X           |             |
|  | IoT Cybersecurity & Distributed Computing |          | x             |               | X           |             |
|  | Connected objects                         | ENG/FR   | x             |               | X           |             |
|  | Digital telecommunication                 |          |               | x             |             | X           |
|  | Information theory and coding             |          |               | x             |             | X           |
|  | Artificial intelligence for the IoT       | ENG/FR   | x             |               | X           |             |
|  | Heterogeneous Big Data                    |          | x             |               | X           |             |
| <b>Design, UX, Information System</b>  |   |          |               |               |             |             |
| Sem. 8 - IPS   | Knowledge representation and reasoning    |          | x             |               | X           |             |
|  | Design Pattern                            |          | x             |               | X           |             |
|  | Software Design: case study               |          | x             |               | X           |             |
|  | Software interoperability                 |          | x             |               | X           |             |
|  | Content management systems                |          | x             |               | X           |             |
|  | User interface design                     |          | x             |               | X           |             |
|  | Mobile app development                    |          | x             |               | X           |             |
|  | Extended Reality (AR and VR)              | ENG/FR   | x             |               | X           |             |
| Sem. 9 - IPS   | Business intelligence                     | ENG/FR   | x             |               | X           |             |
|  | Connected objects                         | ENG/FR   | x             |               | X           |             |
|  | Active and Interactive Learning           | ENG/FR   | x             |               | X           |             |
|  | Heterogeneous Big Data                    | ENG/FR   | x             |               | X           |             |
|  | Interaction design                        |          | x             |               | X           |             |
|  | Virtual Reality Project                   |          | x             |               | X           |             |