

**Faculty Computer Science and Engineering**

Undergraduate SECOND CYCLE OF STUDIES

Study program: **COMPUTER TECHNIQUES AND INFORMATICS (CTI)** 1 year

Active from academic 2023/2024 year

**One-year (60 ECTS) studies**

**Degree:** Master of Science in Computer Techniques and Informatics.

**Acquired skills:** embedded systems design, rapid prototyping, high-performance computing, advanced algorithms, cloud computing, supervisory management and data acquisition, genetic algorithms and machine learning, digital forensics, database confidentiality and security, artificial intelligence, cryptography and social network analysis.

**CTI 1 year**

| Year I        |          |  |                |      |
|---------------|----------|--|----------------|------|
| Semester I    |          |  |                |      |
| No.           | Code     | Course Name                                | No. of classes | ECTS |
| Core Courses  |          |  |                |      |
| 1             | CSE21M01 | Big Data Analytics                         | 2+1            | 6    |
| 2             | CSE21M02 | Advanced Distributed Systems               | 2+1            | 6    |
| 3             | CSE21M03 | Analysis of large social networks          | 2+1            | 6    |
| 4             | CSE21M04 | Advanced algorithms                        | 2+1            | 6    |
| Elective      |          |  |                |      |
| 5             | CSE21Exx | Course from elective list                  | 2+1            | 6    |
|               |          |  |                |      |
| Year I        |          |  |                |      |
| Semester II   |          |  |                |      |
| No.           | Code     | Course Name                                | No. of classes | ECTS |
| 1             | CSE22M05 | Data processing in the fog and at the edge | 2+1            | 6    |
| 2             | CSE22M06 | Master's thesis – final project            |                | 12   |
| Elective      |          |  |                |      |
| 3             | CSE22Exx | Course from elective list                  | 2+1            | 6    |
| 4             | CSE22Exx | Course from elective list                  | 2+1            | 6    |
| Total credits |          |  |                | 60   |

The second cycle of university studies recognizes the modules:

|   |
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| - C - mandatory (core courses),           |
| - MiE – elected from the list of courses. |

| List of Elective courses |          |   |                      |      |
|--------------------------|----------|---|----------------------|------|
| id                       | code     | Course  | Weekly fund of hours | ECTS |
| 1                        | CSE21E01 | Modern simulations and modeling                             | 2+1                  | 6    |
| 2                        | CSE21E02 | Artificial intelligence and expert systems                  | 2+1                  | 6    |
| 3                        | CSE21E03 | Developmental - research methods in science and engineering | 2+1                  | 6    |
| 4                        | CSE21E04 | High performance processing                                 | 2+1                  |      |
| 5                        | CSE21E05 | Platforms Strategy  | 2+1                  | 6    |
| 6                        | CSE22E01 | Automatic verification                                      | 2+1                  | 6    |
| 7                        | CSE22E02 | Database management systems                                 | 2+1                  | 6    |
| 8                        | CSE22E03 | Image processing technologies                               | 2+1                  | 6    |
| 9                        | CSE22E04 | Bioinformatics  | 2+1                  | 6    |
| 10                       | CSE22E05 | Advanced cryptography                                       | 2+1                  | 6    |
| 11                       | CSE22E06 | Supervisory management and data acquisition systems         | 2+1                  | 6    |
| 12                       | CSE22E07 | Advanced Robotics   | 2+1                  | 6    |
| 13                       | CSE22E08 | Communication systems and simulations                       | 2+1                  | 6    |
| 14                       | CTI22E09 | Advanced cloud computing                                    | 2+1                  | 6    |
| 15                       | CSE22E10 | Embedded systems design and rapid prototyping               | 2+1                  | 6    |
| 16                       | CSE22E11 | Knowledge-based decision-making systems                     | 2+1                  | 6    |
| 17                       | CSE22E12 | Genetic algorithms and machine learning                     | 2+1                  | 6    |
| 18                       | CSE22E13 | Digital forensics   | 2+1                  | 6    |
| 19                       | CSE22E14 | Ethical Hacking   | 2+1                  | 6    |
| 20                       | CSE22E15 | Complexity theory   | 2+1                  | 6    |
| 21                       | CSE22E16 | Processing of textual data                                  | 2+1                  | 6    |
| 22                       | CSE22E17 | Bayesian data analysis                                      | 2+1                  | 6    |
| 23                       | CSE22E18 | Performance, reliability and security of databases          | 2+1                  | 6    |
| 24                       | CSE22E19 | Business Process Mining                                     | 2+1                  | 6    |

|    |          |   |     |   |
|----|----------|---|-----|---|
| 25 | CSE22E20 | Advanced topics in artificial intelligence and machine learning | 2+1 | 6 |
| 26 | CSE22E21 | Time Series Analysis and Forecasting                            | 2+1 | 6 |
| 27 | CSE22E22 | Mathematical Logic for Computer Science                         | 2+1 | 6 |
| 28 | CSE22E23 | Computational game theory                                       | 2+1 | 6 |
| 29 | CSE22E24 | Advanced Discrete Structures                                    | 2+1 | 6 |
| 30 | CSE22E25 | Financial forecasting   | 2+1 | 6 |
| 31 | CSE22E26 | Mathematical modelling  | 2+1 | 6 |
| 32 | CSE22E27 | Infrastructure solutions for a smart society                    | 2+1 | 6 |