

Course overview

| Year I | | | | |
|----------------|--------------------|----------------------------|--|--------------|
| Semester I | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core courses | | | | |
| 1 | 11.3.F.1101.C | Programming 1 | 3+2 | 6 |
| 2 | 11.1.F.1102.C | Mathematics 1 | 3+2 | 6 |
| 3 | 11.9.F.1103.C | Discrete Mathematics | 3+2 | 6 |
| 4 | 09.0.F.1104.C | Technical Communication 1 | 3+2 | 6 |
| Minor elective | | | | |
| 5 | 13.2.F.1101.MiE | Physics | 3+2 | 6 |
| Semester II | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core | | | | |
| 1 | 11.3.F.1201.C | Programming 2 | 3+2 | 6 |
| 2 | 11.1.F.1202.C | Mathematics 2 | 3+2 | 6 |
| 3 | 09.0.F.1203.C | Technical Communication 2 | 3+2 | 6 |
| 4 | 11.3.ISVMA.1201.MR | Human-Computer Interaction | 3+2 | 6 |
| 5 | 11.4.ISVMA.1202.MR | Cognitive Science | 3+2 | 6 |

| Year II | | | | |
|-----------------|--------------------|----------------------------------|--|--------------|
| Semester III | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core courses | | | | |
| 1 | 11.3.F.1301.C | Programming 3 | 3+2 | 6 |
| 2 | 11.3.F.1302.C | Database Systems 1 | 3+2 | 6 |
| 3 | 11.3.F.1303.C | Algorithms and Data Structures 1 | 3+2 | 6 |
| 4 | 11.3.ISVMA.1301.MR | Computer Graphics | 3+2 | 6 |
| Elective Course | | | | |

| 5 | 1 course from Minor Elective List | | | |
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| Semester IV | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core courses | | | | |
| 1 | 11.3.F.1401.C | Database Systems 2 | 3+2 | 6 |
| 2 | 11.3.F.1402.C | Algorithms and Data Structures | 3+2 | 6 |
| 3 | | Internet Programming | 3+2 | 6 |
| 4 | 11.3.ISVMA.1401.MR | Multimedia and Design | 3+2 | 6 |
| Minor Elective Course | | | | |
| 5 | 1 course from Minor Elective List | | | |

| Year III | | | | |
|-----------------------|-----------------------------------|----------------------------|--|--------------|
| Semester V | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core Courses | | | | |
| 1 | 11.3.F.1501.C | Programming 4 | 3+2 | 6 |
| 2 | 11.9.ISVMA.1501.MR | Numerical Methods | 3+2 | 6 |
| Major Elective Course | | | | |
| 3 | 1 course from Major Elective List | | | |
| Minor Elective Course | | | | |
| 4 | 1 course from Minor Elective List | | | |
| 5 | 1 course from Minor Elective List | | | |
| Semester VI | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core Courses | | | | |
| 1 | 11.2.F.1601.C | Probability and Statistics | 3+2 | 6 |
| 2 | 11.9.ISVMA.1601.MR | Pattern Recognition | 3+2 | 6 |
| Major Elective Course | | | | |
| 3 | 1 course from Major Elective List | | | |

| Minor Elective Course | | | | |
|-----------------------|-----------------------------------|--|--|--|
| 4 | 1 course from Minor Elective List | | | |
| 5 | 1 course from Minor Elective List | | | |

| Year IV | | | | |
|---|--|------------------------|--|--------------|
| Semester VII | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core Course | | | | |
| 1 | 11.3.ISVMA.1701.MR | Visual Programming | 3+2 | 6 |
| Two Major Elective Course | | | | |
| 2 | 1 course from Major Elective List | | | |
| 3 | 1 course from Major Elective List | | | |
| Two Final Projects from Major Elective Course | | | | |
| 4 | Final Project from MaE List | | | |
| 5 | Final Project from MaE List | | | |
| Semester VIII | | | | |
| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
| Core Courses | | | | |
| 1 | 11.3.F.1801.C | Advanced Algorithms | 3+2 | 6 |
| 2 | 11.9.F.1802.C | Models and Simulations | 3+2 | 6 |
| Two Major Elective Course | | | | |
| 3 | 1 course from Major Elective List | | | |
| 4 | 1 course from Major Elective List | | | |
| Final Project from Major Elective Course | | | | |
| 5 | Final Project from Major Elective List | | | |

List of Minor Elective Courses

| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
|-----|-----------------|---------|--|--------------|
| 1 | 13.9.F.1101.MiE | Physics | 3+2 | 6 |

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| 2 | 03.0.F.1301.MiE | Digital medium and Photography | 3+2 | 6 |
| 3 | 14.1.F.1302.MiE | Political Sciences | 3+2 | 6 |
| 4 | 14.3.F.1303.MiE | Economics | 3+2 | 6 |
| 5 | 08.0.F.1304.MiE | Humanity 1 | 3+2 | 6 |
| 6 | 03.6.F.1401.MiE | History of Arts | 3+2 | 6 |
| 7 | 14.2.F.1402.MiE | Sociology | 3+2 | 6 |
| 8 | 04.0.F.1403.MiE | Management | 3+2 | 6 |
| 9 | 04.0.F.1404.MiE | Entrepreneurship | 3+2 | 6 |
| 10 | 08.0.F.1405.MiE | Humanity 2 | 3+2 | 6 |
| 11 | 14.7.F.1501.MiE | Anthropology | 3+2 | 6 |
| 12 | 04.7.F.1502.MiE | Marketing | 3+2 | 6 |
| 13 | 13.9.F.1503.MiE | Ecology | 3+2 | 6 |
| 14 | 16.0.F.1504.MiE | Culture Heritage | 3+2 | 6 |
| 15 | 16.0.F.1506.MiE | Military Sciences | 3+2 | 6 |
| 16 | 10.0.F.1507.MiE | Ethics and IT Law | 3+2 | 6 |
| 17 | 14.7.F.1601.MiE | Archeology | 3+2 | 6 |
| 18 | 04.9.F.1602.MiE | E-business | 3+2 | 6 |
| 19 | 13.9.F.1603.MiE | Geography information systems GIS | 3+2 | 6 |
| 20 | 15.3.F.1604.MiE | Public Speaking | 3+2 | 6 |
| 21 | 03.0.F.1605.MiE | Graphic design | 3+2 | 6 |
| 22 | 03.2.F.1606.MiE | Music | 3+2 | 6 |
| 23 | 09.9.F.1607.MiE | Macedonian Language | 3+2 | 6 |
| 24 | 13.9.F.1608.MiE | Genetics | 3+2 | 6 |
| 25 | 03.3.F.1609.MiE | Theatre | 3+2 | 6 |

List of Major Elective Courses

| No. | Code | Course | Total Numbers of Lecturers and Tutorials | ECTS Credits |
|-----|-----------------|---------------------------|--|--------------|
| 1 | 11.3.F.1x01.MaE | Client/server system | 3+2 | 6 |
| 2 | 11.9.F.1x02.MaE | Cryptography | 3+2 | 6 |
| 3 | 11.9.F.1x03.MaE | Data Mining | 3+2 | 6 |
| 4 | 04.9.F.1x04.MaE | Project Management | 3+2 | 6 |
| 5 | 11.9.F.1x05.MaE | Computer components | 3+2 | 6 |
| 6 | 11.9.F.1x06.MaE | Systems Theory | 3+2 | 6 |
| 7 | 11.9.F.1x07.MaE | Models and Simulations | 3+2 | 6 |
| 8 | 11.9.F.1x08.MaE | Discrete mathematics 2 | 3+2 | 6 |
| 9 | 11.9.F.1x09.MaE | Integrated Systems Design | 3+2 | 6 |
| 10 | 11.9.F.1x10.MaE | Digital Electronics | 3+2 | 6 |

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| 11 | 11.9.F.1x11.MaE | Digital Libraries | 3+2 | 6 |
| 12 | 11.9.F.1x12.MaE | Distance Learning Systems | 3+2 | 6 |
| 13 | 04.0.F.1x13.MaE | E-commerce | 3+2 | 6 |
| 14 | 14.0.F.1x14.MaE | E-government | 3+2 | 6 |
| 15 | 11.9.F.1x15.MaE | Embedded Systems | 3+2 | 6 |
| 16 | 04.2.F.1x16.MaE | Innovation Technologies | 3+2 | 6 |
| 17 | 04.9.F.1x17.MaE | Commercialization of Technologies and Entrepreneurship | 3+2 | 6 |
| 18 | 11.9.F.1x18.MaE | Internet Programming | 3+2 | 6 |
| 19 | 11.9.F.1x19.MaE | Internet Technologies | 3+2 | 6 |
| 20 | 11.9.F.1x20.MaE | Knowledge Based Systems | 3+2 | 6 |
| 21 | 11.9.F.1x21.MaE | Knowledge Management | 3+2 | 6 |
| 22 | 11.9.F.1x22.MaE | Knowledge Systems | 3+2 | 6 |
| 23 | 11.9.F.1x23.MaE | Engineering Management | 3+2 | 6 |
| 24 | 11.3.F.1x24.MaE | Telecommunication Networks Management | 3+2 | 6 |
| 25 | 04.2.F.1x25.MaE | Management of Technologies and Innovation | 3+2 | 6 |
| 26 | 04.2.F.1x26.MaE | ICT Industry and Management | 3+2 | 6 |
| 27 | 11.9.F.1x27.MaE | Microcomputers Systems | 3+2 | 6 |
| 28 | 11.9.F.1x28.MaE | Modeling of Business Processes | 3+2 | 6 |
| 29 | 11.9.F.1x29.MaE | Language Processing | 3+2 | 6 |
| 30 | 11.9.F.1x30.MaE | Virtual Society | 3+2 | 6 |
| 31 | 11.9.F.1x31.MaE | Visual Programming | 3+2 | 6 |
| 32 | 11.9.F.1x32.MaE | Web Design | 3+2 | 6 |
| 33 | 11.9.F.1x33.MaE | Bioinformatics | 3+2 | 6 |
| 34 | 11.9.F.1x34.MaE | Security and Identity Management | 3+2 | 6 |
| 35 | 11.9.F.1x35.MaE | Electric circles | 3+2 | 6 |
| 36 | 11.9.F.1x36.MaE | Game Theory | 3+2 | 6 |
| 37 | 11.9.F.1x37.MaE | Optimization Theory | 3+2 | 6 |
| 38 | 11.9.F.1x38.MaE | Parallel data processing | 3+2 | 6 |
| 39 | 11.9.F.1x39.MaE | UML designed models | 3+2 | 6 |
| 40 | 11.9.F.1x40.MaE | Cloud Computing Technologies | 3+2 | 6 |
| 41 | 11.9.F.1x41.MaE | Copyrights and technical ideas protection | 3+2 | 6 |
| 42 | 11.9.F.1x42.MaE | Software engineering economics | 3+2 | 6 |

