# STRUCTURE OF THE AUTOMATION AND SYSTEM ENGINEERING STUDY PROGRAM
## FIRST CYCLE FOUR-YEAR ACADEMIC STUDIES

**Courses, 1st year – 1st semester**

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2FI100121 | **Mathematics 1** | 8 | 3+2+2 | 240 |
| 2. | 2ET100121 | **Electrical Engineering 1** | 6 | 2+2+1 | 180 |
| 3. | 2FI100421 | **Fundamentals of computer programming** | 6 | 2+2+1 | 180 |
| 4. | 2ET100421 | **Physics** | 6 | 2+2+1 | 180 |
| 5. | | **Electives from list No.1** | 4 | 2+1+1 | 120 |
| | | **Total ECTS** | **30** | **11+9+6** | **900** |

**List No. 1 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 4FF100721 | **Macedonian language 1** | 4 | 2+1+1 | 120 |
| 2. | 4FF100621 | **English language level A2.1** | 4 | 2+1+1 | 120 |
| 3. | 4FF100221 | **German language level A1.1** | 4 | 2+1+1 | 120 |
| 4. | 4FF100421 | **Italian language level A1.1** | 4 | 2+1+1 | 120 |
| 5. | 4FF100121 | **Spanish language level A1.1** | 4 | 2+1+1 | 120 |
| 6. | 4FF100521 | **French language level A1.1** | 4 | 2+1+1 | 120 |
| 7. | 4FF100321 | **Russian language level A1.1** | 4 | 2+1+1 | 120 |

**Courses, 1st year – 2nd semester**

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2FI101121 | **Mathematics 2** | 6 | 2+2+1 | 180 |
| 2. | 2ET100521 | **Electrical Engineering 2** | 6 | 2+2+1 | 180 |
| 3. | 2FI101221 | **Object-oriented Programming** | 6 | 2+2+1 | 180 |
| 4. | 2ET100721 | **CAD/CAM in electrical engineering** | 6 | 2+2+1 | 180 |
| 5. | | **Electives from list No.2** | 4 | 2+1+1 | 120 |
| 6. | 2ET106421 | **Practical work** | 2 | 0+0+2 | 60 |
| 6. | 2SC100121 | **Sport and recreation** | | | |
| | | **Total ECTS** | **30** | **10+9+7** | **900** |

**List No. 2 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 4FF101421 | **Macedonian language 2** | 4 | 2+1+1 | 120 |
| 2. | 4FF101121 | **English language level A2.2** | 4 | 2+1+1 | 120 |
| 3. | 4FF101221 | **German language level A1.2** | 4 | 2+1+1 | 120 |
| 4. | 4FF100921 | **Italian language level A1.2** | 4 | 2+1+1 | 120 |
| 5. | 4FF100821 | **Spanish language level A1.2** | 4 | 2+1+1 | 120 |
| 6. | 4FF101021 | **French language level A1.2** | 4 | 2+1+1 | 120 |
| 7. | 4FF101321 | **Russian language level A1.2** | 4 | 2+1+1 | 120 |

**Courses, 2ⁿᵈ year – 3ʳᵈ semester**

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2FI106520 | **Mathematics 3** | 8 | 3+2+2 | 240 |
| 2. | 2ET100921 | **Electrical Measurements** | 8 | 3+2+2 | 240 |
| 3. | 2ET100921 | **Electronics** | 6 | 2+2+1 | 180 |
| 4. | | **Electives from list No.3** | 4 | 2+1+1 | 120 |
| 5. | | **Electives from list No.4** | 4 | 2+1+1 | 120 |
| | | **Total ECTS** | **30** | **12+8+7** | **900** |

**List No. 3 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2FI130221 | **Probability and Statistics** | 4 | 2+1+1 | 120 |
| 2. | 2ET100321 | **Theory of signals and systems** | 4 | 2+1+1 | 120 |

**List No. 4 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2ET101121 | **Electrical Installations** | 4 | 2+1+1 | 120 |
| 2. | 2ET101221 | **Electrical Engineering Materials** | 4 | 2+1+1 | 120 |

**Courses, 2ⁿᵈ year – 4ᵗʰ semester**

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2ET101321 | **Fundamentals of automation** | 6 | 2+2+1 | 180 |
| 2. | 2ET101421 | **Power Electronics** | 6 | 2+2+1 | 180 |
| 3. | 2ET101521 | **Electrical Machines** | 6 | 2+2+1 | 180 |
| 4. | 2ET100321 | **Fundamentals of energy and energy legislation** | 6 | 2+2+1 | 180 |
| 5. | | **Electives from list No.5** | 4 | 2+1+1 | 120 |
| 6. | 2ET106421 | **Practical work** | 2 | 0+0+2 | 60 |
| | | **Total ECTS** | **30** | **10+9+7** | **900** |

**List No. 5 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2ET101021 | **Modeling and simulations** | 4 | 2+1+1 | 120 |
| 2. | 2ET102021 | **Mobile platforms and applications** | 4 | 2+1+1 | 120 |

**Courses, 3ʳᵈ year – 5ᵗʰ semester**

| No. | Code | Courses | ECTS | Hours | Total |
|-----|------|---------|------|-------|-------|
| 1. | 2ET101621 | **Electrical Circuits Theory** | 8 | 3+2+2 | 240 |
| 2. | 2ET101721 | **Logic circuits and discrete systems** | 8 | 3+2+2 | 240 |
| 3. | 2ET010821 | **Electrical Drives** | 6 | 2+2+1 | 180 |
| 4. | | **Electives from list No.6** | 4 | 2+1+1 | 120 |
| 5. | | **Electives from list No.7** | 4 | 2+1+1 | 120 |
| | | **Total ECTS** | **30** | **12+8+7** | **900** |

**List No. 6 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET101921 | Supervisory Control and Data Acquisition Systems | 4 | 2+1+1 | 120 |
| 2. | 2ET103321 | Web technologies | 4 | 2+1+1 | 120 |

**List No. 7 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET102121 | Impulse and Digital Electronic | 4 | 2+1+1 | 120 |
| 2. | 2ET103621 | Computer Architecture | 4 | 2+1+1 | 120 |

**Courses, 3rd year – 6th semester**

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET104221 | Introduction to Digital Communications | 6 | 2+2+1 | 180 |
| 2. | 2ET105121 | Computer Control of Process | 6 | 2+2+1 | 180 |
| 3. | 2ET102821 | Electromagnetics | 6 | 2+2+1 | 180 |
| 4. | 2ET104421 | Engineering Economics | 6 | 2+2+1 | 180 |
| 5. |  | Electives list No.8 | 4 | 2+1+1 | 120 |
| 6. | 2ET106421 | Practical work | 2 | 0+0+2 | 60 |
|  |  | **Total ECTS** | **30** | **10+9+7** | **900** |

**List No. 8 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET102521 | Discrete control systems | 4 | 2+1+1 | 120 |
| 2. | 2ET102621 | Process automation | 4 | 2+1+1 | 120 |

**Courses, 4th year – 7th semester**

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET103121 | Robotics and automation | 8 | 3+2+2 | 240 |
| 2. | 2ET103021 | Electrical actuators and sensors | 8 | 3+2+2 | 240 |
| 3. | 2ET102921 | Microprocessor Systems | 6 | 2+2+1 | 180 |
| 4. |  | Electives from list No.9 | 4 | 2+1+1 | 120 |
| 5. |  | Electives from list No.10 | 4 | 2+1+1 | 120 |
|  |  | **Total ECTS** | **30** | **12+8+7** | **900** |

**List No. 9 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET105421 | Geoinformatics | 4 | 2+1+1 | 120 |
| 2. | 2ET105521 | Technical Standards and Regulative | 4 | 2+1+1 | 120 |

**List No. 10 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET103421 | Electricity Markets | 4 | 2+1+1 | 120 |
| 2. | 2ET103521 | Telecommunication Networks | 4 | 2+1+1 | 120 |

**Courses, 4th year – 8th semester**

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET103921 | **Mechatronics** | 4 | 2+1+1 | 120 |
| 2. | 2ET103721 | **Microcomputers and programmable controllers** | 4 | 2+1+1 | 120 |
| 3. | 2ET105221 | **Software for Automation** | 4 | 2+1+1 | 120 |
| 4. | | **Electives from list No.11** | 4 | 2+1+1 | 120 |
| 5. | | **Electives from list No.12** | 4 | 2+1+1 | 120 |
| 6. | 2ET106621 | **Practical work – interdisciplinary project** | 4 | 0+0+4 | 120 |
| 7. | 2ET104021 | **Graduate Thesis** | 6 | 0+0+8 | 180 |
| | | **Total ECTS** | **30** | **10+5+17** | **900** |

**List No. 11 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET106221 | **Microelectronic Circuits** | 4 | 2+1+1 | 120 |
| 2. | 2ET106121 | **Energy and ecology** | 4 | 2+1+1 | 120 |

**List No. 12 of elective subjects** (choose one of the offered subjects)

| No. | Code | Courses | ECTS | Hours | Total |
|---|---|---|---|---|---|
| 1. | 2ET106321 | **Electromobility** | 4 | 2+1+1 | 120 |
| 2. | 2ET106021 | **Industrial robots** | 4 | 2+1+1 | 120 |