

CURRICULUM

60711500- Mechatronics and Robotics

Name of qualification: **Bachelor of Engineering Sciences**
 Official length of programme: **Four years studies, 240 credits**
 Mode of studies: **Continual studies**

| Course type | Course code | Course name | Credit | Hours | Classes | | | | | Self-study | Course type | Course code | Course name | Credit | Hours | Classes | | | | | Self-study |
|------------------------------|-------------|---|-----------|-------------|------------|------------|------------|------------|-----------|------------------------------|----------------------------|------------------------|--|-----------|-------------|------------|------------|------------|------------|-----------|------------|
| | | | | | Total | Lecture | Practice | Labs | Seminar | | | | | | | Total | Lecture | Practice | Labs | Seminar | |
| 1 semester (15 weeks) | | | | | | | | | | 2 semester (15 weeks) | | | | | | | | | | | |
| 1 | | Modern history of Uzbekistan | 4 | 120 | 60 | 30 | | | 30 | 60 | 1 | | Engineering and computer graphics | 4 | 120 | 60 | 30 | 30 | | | 60 |
| 1 | | Physics 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 1 | | Physics 2 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 2 | | Programming language (C) | 4 | 120 | 60 | 30 | 30 | | | 60 | 3 | | Automatic control systems 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 1 | | Higher Mathematics 1 | 6 | 180 | 90 | 45 | 45 | | | 90 | 1 | | Higher Mathematics 2 | 4 | 120 | 60 | 30 | 30 | | | 60 |
| 3 | | Introduction to the specialty | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Electromechanical systems (with term paper) | 6 | 180 | 90 | 30 | 30 | 30 | | 90 |
| 1 | | Uzbek (Russian) language 1 | 4 | 120 | 60 | | 60 | | | 60 | 2 | | Uzbek (Russian) language 2 | 2 | 60 | 30 | | 30 | | | 30 |
| 2 | | Ecology | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Algorithmization and information processing | 4 | 120 | 60 | 30 | 30 | | | 60 |
| | | | | | | | | | | 6 | | Academic writing | 2 | 60 | 30 | | 30 | | | | 30 |
| Total for semester: | | | 30 | 900 | 450 | 195 | 180 | 45 | 30 | 450 | Total for semester: | | | 30 | 900 | 450 | 180 | 210 | 60 | 0 | 450 |
| | | | | | | | | | | | | Qualification practice | 0 | | | | | | | | |
| Total for year: | | | 60 | 1800 | 900 | 375 | 390 | 105 | 30 | 900 | Total for year: | | | 60 | 1800 | 900 | 375 | 390 | 105 | 30 | 900 |
| 3 semester (15 weeks) | | | | | | | | | | 4 semester (15 weeks) | | | | | | | | | | | |
| 2 | | Electrical Engineering and Electronics 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Electrical Engineering and Electronics 2 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 2 | | Circuitry and microprocessor systems 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Circuitry and microprocessor systems 2 (with course project) | 6 | 180 | 90 | 30 | 30 | 30 | | 90 |
| 2 | | Automatic control systems 2 (with term paper) | 6 | 180 | 90 | 30 | 30 | 30 | | 90 | 2 | | C++ programming language | 4 | 120 | 60 | 30 | | 30 | | 60 |
| 1 | | Higher Mathematics 3 | 4 | 120 | 60 | 30 | 30 | | | 60 | 2 | | Power electronics | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 3 | | Microcontrollers and industrial controllers 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 3 | | Microcontrollers and industrial controllers 2 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 2 | | Solid mechanics | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Metrology and standardization | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 1 | | Foreign language | 4 | 120 | 60 | | 60 | | | 60 | 1 | | Special foreign language | 4 | 120 | 60 | | 60 | | | 60 |
| Total for semester: | | | 30 | 900 | 450 | 180 | 360 | 90 | 0 | 450 | Total for semester: | | | 30 | 900 | 450 | 180 | 150 | 0 | 0 | 450 |
| | | | | | | | | | | | | Internship | 0 | | | | | | | | |
| Total for year: | | | 60 | 1800 | 900 | 360 | 510 | 90 | 0 | 900 | Total for year: | | | 60 | 1800 | 900 | 360 | 510 | 90 | 0 | 900 |
| 5 semester (15 weeks) | | | | | | | | | | 6 semester (15 weeks) | | | | | | | | | | | |
| 1 | | Philosophy | 4 | 120 | 60 | 30 | 30 | | | 60 | 4 | | Modeling mechatronic modules and robots | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 3 | | Mechatronic system drives 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 4 | | Mechatronic system drives 2 (with term paper) | 6 | 180 | 90 | 30 | 30 | 30 | | 90 |
| 2 | | Robotics | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 4 | | Robotic technologies | 4 | 120 | 60 | 30 | 30 | | | 60 |
| 3 | | Design of mechatronic modules 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 4 | | Design of mechatronic modules 2 (with coursework) | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 4 | | Design of robot control systems 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 2 | | Design of robot control systems 2 (with term paper) | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| 4 | | Fundamentals of Robot Programming | 6 | 180 | 90 | 30 | 30 | 30 | | 90 | 2 | | Economy and management of the industry | 4 | 120 | 60 | 30 | | | 30 | 60 |
| 4 | | Open Elective Course 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | 4 | | Open Elective Course 2 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |
| Total for semester: | | | 30 | 900 | 450 | 210 | 135 | 105 | 0 | 450 | Total for semester: | | | 30 | 900 | 450 | 210 | 120 | 90 | 30 | 450 |
| | | | | | | | | | | | | Industrial Internship | 0 | | | | | | | | |
| Total for year: | | | 60 | 1800 | 900 | 420 | 255 | 195 | 30 | 900 | Total for year: | | | 60 | 1800 | 900 | 420 | 255 | 195 | 30 | 900 |
| 7 semester (15 weeks) | | | | | | | | | | 8 semester (10 weeks) | | | | | | | | | | | |
| 4 | | Information devices of mechatronic modules and robots 1 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 | | | Information devices of mechatronic modules and robots 2 | 4 | 120 | 60 | 30 | 15 | 15 | | 60 |

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|---|--|-----------|------------|------------|------------|------------|------------|----------|------------|--|------------|-------------|-------------|------------|------------|------------|----------|-------------|-----------|-------------|
| 4 | Automatic design systems (CAD/CAM/CAE systems) 1 | 6 | 180 | 90 | 30 | 30 | 30 | 90 | 5 | Automatic design systems (CAD/CAM/CAE systems) 2 | 4 | 120 | 60 | 30 | 15 | 15 | 60 | | | |
| 4 | Artificial intelligence systems | 4 | 120 | 60 | 30 | 30 | | 60 | 5 | Elective Course 4 | 4 | 120 | 60 | 30 | 15 | 15 | 60 | | | |
| 5 | Elective Course 1 | 4 | 120 | 60 | 30 | 30 | | 60 | 4 | Graduation Thesis (Thesis project) | 18 | 540 | | | | | 540 | | | |
| 5 | Elective Course 2 | 6 | 180 | 90 | 30 | 30 | 30 | 90 | | | | | | | | | | | | |
| 5 | Elective Course 2 | 6 | 180 | 90 | 30 | 30 | 30 | 90 | | | | | | | | | | | | |
| Total for semester: | | 30 | 900 | 450 | 180 | 165 | 105 | 0 | 450 | Total for semester: | 30 | 900 | 180 | 90 | 45 | 45 | 0 | 720 | | |
| 1. Humanitarian and Social sciences Courses | | | | | | | | | | Career Internship | 0 | | | | | | | | | |
| 2. Mathematical and Natural science Courses | | | | | | | | | | Total for year: | 60 | 1800 | 630 | 270 | 210 | 150 | 0 | 1170 | | |
| 3. General Professional Courses | | | | | | | | | | | | | | | | | | | | |
| 4. Professional Courses | | | | | | | | | | | | | | | | | | | | |
| 5. Professional Elective Courses | | | | | | | | | | Total: | 240 | 7200 | 3330 | 142 | 136 | 5 | 5 | 540 | 60 | 3870 |

Elective courses:

1. Human safety and environmental protection
2. Industrial robots
3. Basics of 3D modeling
4. Mobile robots
5. Vision systems
6. Intelligensys robots