Bachelor Program: Energy and resource-saving processes in chemical technology, petrochemistry and biotechnology

Institute: Institute of Urban Planning, Architecture & Civil Engineering

Study Program: Oil and gas processing technologies, environmental engineering

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| **№** | **Subject** | **Semester** | **Hours** | **Credits** |
|  | **Basic part** |  |  |  |
| Б.1.1.1 | History of Russia | 1 | 108 | 3 |
| Б.1.1.2 | Philosophy | 5 | 108 | 3 |
| Б.1.1.3 | Foreign language | 3 | 288 | 8 |
| Б.1.1.6 | Mathematics | 1-4 | 540 | 15 |
| Б.1.1.7 | Computer science | 1, 2 | 216 | 6 |
| Б.1.1.8 | Physics | 1-3 | 360 | 10 |
| Б.1.1.9 | General and inorganic chemistry | 1 | 108 | 3 |
| Б.1.1.10 | Organic chemistry | 4 | 144 | 4 |
| Б.1.1.11 | Physical and chemical analysis methods | 2 | 108 | 3 |
| Б.1.1.12 | Colloid chemistry | 6 | 108 | 3 |
| Б.1.1.13 | Physical chemistry | 5 | 72 | 2 |
| Б.1.1.14 | Ecology | 1 | 108 | 3 |
| Б.1.1.15 | Engineering graphics (plotting) | 1 | 72 | 2 |
| Б.1.1.16 | Descriptive geometry and computer graphics | 2 | 108 | 3 |
| Б.1.1.17 | Applied mechanics | 3 | 144 | 4 |
| Б.1.1.18 | Electrical engineering and industrial electronics | 5 | 108 | 3 |
| Б.1.1.19 | Life safety | 3 | 108 | 3 |
| Б.1.1.20 | General chemical technology | 5 | 108 | 3 |
| Б.1.1.21 | Processes and equipments of chemical technology | 5 | 180 | 5 |
| Б.1.1.22 | Environmental protection processes and equipments | 7 | 108 | 3 |
| Б.1.1.23 | Modeling of energy- and resource-saving processes in chemical technology, petrochemistry, and biotechnology | 6 | 108 | 3 |
| Б.1.1.24 | Industrial ecology | 4 | 180 | 5 |
| Б.1.1.25 | The management system of chemical-technological processes | 7 | 72 | 2 |
| Б.1.1.26 | Physical culture | 1 | 72 | 2 |
|  | **Variable part** |  |  |  |
| Б.1.2.1 | History of science and technology | 2 | 72 | 2 |
| Б.1.2.2 | Philosophy of science and technology | 6 | 72 | 2 |
| Б.1.2.3 | Intercultural and professional communication in a foreign language | 4, 5 | 144 | 4 |
| Б.1.2.4 | Mathematical methods of processing the results of a scientific experiment | 3 | 108 | 3 |
| Б.1.2.5 | Biochemistry | 6 | 108 | 3 |
| Б.1.2.6 | Additional chapters of analytical chemistry | 3 | 72 | 2 |
| Б.1.2.7 | Additional chapters of physical chemistry | 6 | 144 | 4 |
| Б.1.2.8 | Earth science | 3 | 108 | 3 |
| Б.1.2.9 | Applied ecology | 2 | 144 | 4 |
| Б.1.2.10 | Metrology, standardization and certification | 7 | 144 | 4 |
| Б.1.2.11 | Toxicology | 5 | 180 | 5 |
| Б.1.2.12 | Ecological monitoring | 7 | 144 | 4 |
| Б.1.2.13 | Processes and equipments of lithosphere protection | 7 | 108 | 3 |
| Б.1.2.14 | Ecological and economic mechanism of environmental management | 8 | 108 | 3 |
| Б.1.2.15 | Environmental management and audit | 6 | 144 | 4 |
| Б.1.2.16 | Greening of technologies and waste-free production | 8 | 144 | 4 |
| Б.1.2.17 | Environmental impact assessment and environmental expertise | 7 | 144 | 4 |
| Б.1.2.18 | Theory and methods of risk analysis of complex technical systems | /7 | /252 | /7 |
| Б.1.2.19 | Materials science. Technology of construction materials | 4 | 72 | 2 |
| Б.1.2.20 | Technical thermodynamics and heat engineering | 4 | 72 | 2 |
| Б.1.2.21 | Xenobiotics | 8 | 108 | 3 |
|  | **Elective courses** |  |  |  |
| Б.1.3.1.1 | Psychology | 3 | 108 | 3 |
| Б.1.3.1.2 | Engineering psychology | /3 | /108 | /3 |
| Б.1.3.2.1 | History of Russian culture | 1 | 72 | 2 |
| Б.1.3.2.2 | World cultural heritage | /1 | /72 | /2 |
| Б.1.3.3.1 | Human physiology | 6 | 144 | 4 |
| Б.1.3.3.2 | Mammalian physiology | /6 | /144 | /4 |
| Б.1.3.4.1 | Environmental chemistry | 5 | 144 | 4 |
| Б.1.3.4.2 | Physico-chemical processes in the technosphere | /5 | /144 | /4 |
| Б.1.3.5.1 | Fundamentals of microbiology and biotechnology | 7 | 144 | 4 |
| Б.1.3.5.2 | Epidemiology | /\7 | /144 | /4 |
| Б.1.3.6.1 | Basics of water preparing and water treatment | 5 | 72 | 2 |
| Б.1.3.6.2 | Wastewater treatment of industrial enterprises | /5 | /72 | /2 |
| Б.1.3.7.1 | Geochemistry of the biosphere | 4 | 180 | 5 |
| Б.1.3.7.2 | Geophysics of the biosphere | /4 | /180 | /5 |
| Б.1.3.8.1 | Technical tool and technologies for controlling pollution sources | 8 | 144 | 4 |
| Б.1.3.8.2 | Methods of controlling sources of environmental pollution | /8 | /144 | /4 |
| Б.1.3.9.1 | Safety culture | 1 | 144 | 4 |
| Б.1.3.9.2 | Valeology | /1 | /144 | /4 |
| Б.1.3.10.1 | Geoinformation technology | 6 | 180 | 5 |
| Б.1.3.10.2 | Geoinformation technologies in the management of life safety | /6 | /180 | /5 |
| Б.1.3.11.1 | Game sports | /2-6 | /328 | 0 |
| Б.1.3.11.2 | Sports and recreation activities | /2-6 | /328 | 0 |
|  | **Practice (the variable part)** |  |  |  |
| B.2.1 | 1st Training practice | 2 | 108 | 3 |
| B.2.2 | 2nd Training practice | 4 | 108 | 3 |
| B.2.3 | Production practice | 6 | 108 | 3 |
| B.2.4 | Production practice (research work) | 8 | 108 | 3 |
| B.2.5 | Externship | 8 | 216 | 6 |
| **V.3** | **The state final examination (the basic part)** |  | 216 | 6 |
| **F.** | **Optional subjects** |  |  |  |
| F.1 | Military training | 4-8 | 843 | 7 |
| F.2 | Using of applied information technologies in scientific research | 4 | 72 | 2 |
| F.3 | Statistical processing of research results | 6 | 72 | 2 |
|  | **Total** |  | **6480** | **180** |