

**CATALOGUE OF PROGRAMS AND COURSES**  
**TAUGHT AT THE UNIVERSITY OF MINING AND GEOLOGY**  
**"ST. IVAN RILSKI"**  
**2023/2024**

**COURSES THAT CAN BE TAUGHT IN FOREIGN LANGUAGE**

**EQF Level 7 "Master"**

| Year* | Semester | Course unit code | Full name of the course unit                                     | Form of assessment | Workload          |                               | Overall hours | Credits (ECTS) | Language of instruction | Course leader                       |
|-------|----------|------------------|--|--------------------|-------------------|-------------------------------|---------------|----------------|-------------------------|-------------------------------------|
|       |          |                  |  |                    | Lectures per week | Exercises / Seminars per week |               |                |                         |                                     |
| 1     | Autumn   | 132146           | Geoarchaeology   | E                  | 1                 | 1                             | 60            | 5              | ENG                     | Assoc. Prof. Dr. Pristavova         |
| 1     | Autumn   | 132109           | Gemmology  | E                  | 2                 | 3                             | 75            | 6              | ENG                     | Assist Prof. Dr. Tzankova           |
| 1     | Autumn   | 132137           | Gem testing and grading  | CA                 | 2                 | 2                             | 56            | 5              | ENG<br>RUS              | Assist. Prof. Dr. Tzankova          |
| 1     | Spring   | 132111           | Metamorphism and metamorphic processes                           | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assoc. Prof. Dr. Pristavova         |
| 1     | Autumn   | 112227           | Organic petrology  | E                  | 2                 | 2                             | 60            | 5              | ENG                     | Assoc. Prof. Alexandar Zdravkov     |
| 1     | Autumn   | 112235           | Organic geochemistry   | E                  | 2                 | 2                             | 60            | 5              | ENG                     | Assoc. Prof. Dr. Alexandar Zdravkov |
| 1     | Spring   | 112129           | Mining geology   | CA                 | 2                 | 2                             | 60            | 5              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 1     | Autumn   | 112121           | GIS in Hydrogeology  | E                  | 3                 | 2                             | 75            | 5.2            | ENG                     | Assoc. Prof. Dr. Kamen Popov        |
| 1     | Spring   | 112124           | Remote sensing in geology  | E                  | 2                 | 2                             | 60            | 5              | ENG                     | Assoc. Prof. Dr. Kamen Popov        |
| 1     | Autumn   | 332119           | Microcontrolers  | E                  | 3                 | 4                             | 105           | 8              | ENG,<br>RUS             | Assoc. Prof. Dr. Y. Gorbounov       |
| 1     | Spring   | 332146           | Reprogrammable systems   | E                  | 2                 | 2                             | 56            | 8              | ENG,<br>RUS             | Assoc. Prof. Dr. Y. Gorbounov       |
| 1     | Spring   | 282110           | Chemical and physicochemical methods for water treatment         | E                  | 2                 | 2                             | 60            | 4              | ENG,<br>RUS             | Prof. Dr. M. Panayotova             |
| 1     | Spring   | 242127           | Chemical and physicochemical methods for liquid waste management | E                  | 3                 | 2                             | 75            | 6              | ENG,<br>RUS             | Prof. M. Dr. Panayotova             |

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|-------|-----------------|------------------|--|--------------------|----------|---------------|----------------|-------------|---------------|--|
| 1     | Spring          | 162131           | Oil and gas storage  | E                  | 2        | 2             | 60             | 5           | ENG, RUS      | Assist. Prof. Dr. Lachezar Nikolov Georgiev  |
| 1     | Autumn          | 162151           | Design of gas supply systems                                   | E                  | 3        | 3             | 75             | 8           | ENG, RUS      | Assoc. Prof. Dr. Martin Minkov Boyadzhiev  |
| 1     | Spring          | 172163           | Biotechnologies for green energy generation                    |                    | 3        | 3             | 90             | 7           |               | Assist. Prof. Dr. Polina Velichkova  |
| 1     | Autumn          | 142132           | Engineering Geophysics   | E                  | 3        | 3             | 90             | 7           | ENG           | Prof. DSc. Stefan Dimovski   |
| 1     | Autumn          | 142102           | Pre-Processing and Graphical Presentation of Geophysical Data  | CA                 | 3        | 3             | 75             | 5           | ENG           | Assoc. Prof. Dr. Maya Tomova   |
| 1     | Autumn          | 142131           | Methods of Solving Ill-Conditioned Problems in Geophysics      | E                  | 3        | 3             | 90             | 7           | ENG           | Assist. Prof. Dr. Christian Tsankov  |
| 1     | Spring          | 142137           | Exploration Geophysics   | E                  | 3        | 3             | 90             | 7           | ENG           | Prof. DSc. Stefan Dimovski   |
| 1     | Spring          | 142140           | Earth Magnetism and Geoelectrical Fields                       | E                  | 3        | 3             | 90             | 7           | ENG           | Assist. Prof. Dr. Christian Tsankov  |
| 1     | Spring          | 142141           | Gravimetry   | E                  | 2        | 3             | 75             | 5           | ENG           | Assist. Prof. Dr. Christian Tsankov  |
| 1     | Spring          | 142138           | Petroleum Geophysics   | E                  | 3        | 3             | 90             | 7           | ENG           | Assoc. Prof. Dr. Maya Tomova   |
| 1     | Autumn          | 122242           | Application of GIS in landscape research                       | CA                 | 1        | 4             | 75             | 6           | ENG           | Assist. Prof. Dr. Valentina Nikolova   |
| 1     | Autumn          | 171126           | Environmental Geology  | E                  | 2        | 3             | 75             | 6           | ENG           | Assoc. Prof. Dr. Ivan Dimitrov   |
| 1     | Autumn          | 122141           | GIS documenting and management of protected areas              | E                  | 2        | 3             | 75             | 6           | ENG           | Assist. Prof. Dr. Dimitar Sachkov  |
| 1     | Autumn          | 122218           | Special methods of 3D geological analysis                      | E                  | 2        | 3             | 75             | 6           | ENG           | Assoc. Prof. Dr. Ivan Dimitrov   |
| 1     | Autumn          | 122216           | Geodynamic processes and phenomena                             | E                  | 2        | 3             | 75             | 6           | ENG           | Assoc. Prof. Dr. Ivan Dimitrov   |
| 1     | Autumn / Spring | 252142           | 3D modeling and Virtual Reality (VR)                           | E                  |          | 3             | 45             | 4           | ENG           | Assoc. Prof. Dr. Asparuh Kamburov  |
| 1     | Autumn / Spring | 252119           | Global Navigation Satellite Systems (GNSS)                     | E                  | 2        | 3             | 75             | 5           | ENG           | Assoc. Prof. Dr. Asparuh Kamburov  |
| 1     | Autumn / Spring | 252114           | Server and Cloud GIS   | E                  | 2        | 2             | 60             | 4           | ENG           | Assoc. Prof. Dr. Asparuh Kamburov  |
| 2     | Spring          | 252108           | Mine surveying in underground mining                           | E                  | 3        | 3             | 90             | 6           | ENG           | Prof. Dr. Stanislav Topalov, Assoc. Prof. Dr. Milena Begnovska, Dr. Sergey Mihalev |
| 2     | Autumn          | 262133           | Risks by Environmental Spread of Industrial Harmful Substances | CA                 | 1        | 2             | 45             | 3           | ENG, German   | Assist. Prof. Dr. Nadezhda Kostadinova   |
| 2     | Autumn          | 262131           | Ergonomics   | E                  | 2        | 1             |                | 4           | ENG, German   | Assist. Prof. Nadezhda Kostadinova,  |

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|-------|----------|------------------|--|--------------------|----------|---------------|----------------|----------|---------------|--|
| 2     | Spring   | 262113           | Mine Aerology  | E                  | 2        | 2             | 60             | 3        | ENG, German   | Assist. Prof. Dr. Nadezhda Kostadinova, Assoc. Prof. Zahari Dinchev    |
| 1     | Autumn   | 262108           | Industrial Hygiene and Occupational Diseases                     | E                  | 3        | 2             | 75             | 6        | ENG, German   | Assoc. Prof. Dr. Blagovesta Vladkova<br>Assist. Prof. Dr. Dobri Dobrev |
| 1     | Autumn   | 262106           | Industrial Safety - Process and Plant Safety                     | E                  | 4        | 2             | 90             | 7        | ENG, German   | Assoc. Prof. Blagovesta Vladkova<br>Assist. Prof. Dr. Dobri Dobrev     |
| 2     | Spring   | 262122           | Industrial Risk Management                                       | E                  | 2        | 3             | 75             | 7        | ENG           | Assoc. Prof. Blagovesta Vladkova<br>Assist. Prof. Dr. Dobri Dobrev     |
| 1     | Autumn   | 272129           | Corporate Social Responsibility                                  | E                  | 3        | 1             | 60             | 5        | ENG           | Assoc. Prof. Dr. Vessela Petrova                                       |
| 2     | Autumn   | 272143           | Introduction to the principles of the circular economy           | E                  | 2        | 1             | 30             | 4        | ENG           | Assoc. Prof. Dr. V. Petrova  |
| 1     | Autumn   | 272128           | Management of the Environmental Impact                           | E                  | 3        | 1             | 60             | 5        | ENG           | Assoc. Prof. Dr. Vessela Petrova                                       |
| 1     | Autumn   | 272233           | Organizational Behaviour   | E                  | 2        | 1             | 45             | 4        | RUS           | Assoc. Prof. Dr. Maria Fartunova                                       |
| 1     | Spring   | 272138           | Sociology of Management  | E                  | 3        | 1             | 60             | 5        | RUS           | Assoc. Prof. Dr. Maria Fartunova                                       |
| 1     | Spring   | 272139           | Standardization and Certification                                | E                  | 2        | 1             | 30             | 3        | ENG           | Assoc. Prof. Dr. Vessela Petrova                                       |
| 2     | Spring   | 272250           | Technological Renovation and Globalization                       | CA                 | 2        | 1             | 30             | 3        | RUS           | Assoc. Prof. Dr. Maria Fartunova                                       |
| 1     | Spring   | 352119           | Wärme- und Stoffübertragung= Heat and mass transfer              | E                  | 2        | 2             | 60             | 5        | GER<br>ENG    | Assoc. Prof. Dr. E. Kraichev   |
| 2     | Autumn   | 212141           | Quality Control of the Production of Opencast Mines and Quarries | E                  | 3        | 3             | 72*            | 6        | ENG           | Assist. Prof. Dr. Dimitar Kaykov                                       |
| 1     | Autumn   | 122132           | Diploma thesis preparation and defense                           | Geoinformatics     |          |               |                | 15       | ENG           | Assoc. Prof. Dr. Ivan Dimitrov   |

\* According to the curriculum of the University of Mining and geology; ENG = English; RUS = Russian; E = Exam; CA = Continuous assessment

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|-------|----------|------------------|---|--------------------|----------|---------------|----------------|-------------|---------------|---------------------------------|
| 4     | Spring   | 232149           | Pure Blasting Chemical Compounds and Raw Materials for the Production of Blasting Materials   | E                  | 2        | 3             | 42             | 7           | ENG           | Prof. PhD Valery Mitkov         |
| 1     | Autumn   | 232154           | Principles in the Theory of the Blasting Phenomenon and Blasting Principles in the Theory of the Blasting Phenomenon and Blasting Agents                                      | E                  | 3        | 3             | 45             | 7           | ENG           | Prof. PhD Valery Mitkov         |
| 1     | Spring   | 232173           | Blasting Operation Technology in Open Pits and in Underground Mines<br>Blasting Operation Technology in Open Pits and in Underground Mines and in Special Blasting Operations | E                  | 3        | 3             | 45             | 7           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 1     | Spring   | 212159           | Blasting Operations Safety  | E                  | 2        | 2             | 60             | 5           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 1     | Spring   | 212161           | Blasting Operation Technologies   | E                  | 2        | 2             | 60             | 5           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 1     | Spring   | 212160           | Design of Blasting Operations   | E                  | 2        | 2             | 60             | 5           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 2     | Autumn   | 212165           | Blasting works in underground conditions  | E                  | 2        | 2             | 60             | 5           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 2     | Autumn   | 212166           | Blasting works in urban conditions  | E                  | 1        | 5             | 72             | 6           | ENG           | Assoc. Prof. PhD Peter Shishkov |
| 2     | Autumn   | 232135           | Geotechnics   | E                  | 3        | 3             | 84             | 5           | ENG           | Ch. Assist. PhD Veselin Balev   |
| 4     | Spring   | 232149           | Pure Blasting Chemical Compounds and Raw Materials for the Production of Blasting Materials   | E                  | 2        | 3             | 42             | 7           | ENG           | Ch. Assist. PhD Zdravka Mollova |
| 1     | Autumn   | 232154           | Principles in the Theory of the Blasting Phenomenon and Blasting Principles in the Theory of the Blasting Phenomenon and Blasting Agents                                      | E                  | 3        | 3             | 45             | 7           | ENG           | Ch. Assist. PhD Zdravka Mollova |
| 2     | Autumn   | 232136           | Engineering Software  | E                  | 2        | 2             | 56             | 5           | ENG           | Assist. PhD Rafail Rafailov     |
| 2     | Autumn   | 232169           | Building Materials and Constructions  | E                  | 2        | 2             | 56             | 5           | ENG           | Assist. PhD Rafail Rafailov     |

## EQF Level 6 "Bachelor"

| Year* | Semester | Course unit code | Full name of the course unit                            | Form of assessment | Workload          |                               | Overall hours | Credits (ECTS) | Language of instruction | Course leader   |
|-------|----------|------------------|---|--------------------|-------------------|-------------------------------|---------------|----------------|-------------------------|---|
|       |          |                  |   |                    | Lectures per week | Exercises / Seminars per week |               |                |                         |   |
| 1     | Spring   | 211125           | Technology of mining                                    | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assist. Prof. Dr. Dimitar Kaykov                        |
| 3     | Spring   | 211112           | Draining and pit slope stability                        | E                  | 2                 | 2                             | 56            | 4              | FR<br>RUS               | Assoc. Prof. Dr. Evgeniya Aleksandrova                  |
| 2     | Autumn   | 311104           | Materials sciences and technology of materials          | E                  | 3                 | 3                             | 84            | 7              | ENG                     | Assoc. Prof. Dr. Minin, Assoc Prof. Dr. Nedyalkov       |
| 3     | Spring   | 311111           | Mineral Processing Machines                             | E                  | 2                 | 3                             | 70            | 6              | ENG                     | Assoc. Prof. Dr. Minin, Assoc. Prof. Dr. Nedyalkov      |
| 3     | Autumn   | 311109           | Manufacturing Technologies and Machine Tools            | E                  | 2                 | 3                             | 70            | 5              | ENG                     | Assoc. Prof. Dr. Nedyalkov                              |
| 3     | Spring   | 311112           | Computer Dynamical Analysis of Machines                 | E                  | 1                 | 2                             | 42            | 5              | ENG                     | Assoc. Prof. Dr. Nedyalkov                              |
| 4     | Spring   | 311123           | Computer Strain-Strength and Modal Analysis of Machines | E                  | 2                 | 2                             | 56            | 4              | ENG                     | Assoc. Prof. Dr. Nedyalkov                              |
| 3     | Spring   | 171173           | Methods and technologies for production of biogas       | E                  | 1                 |                               | 28            | 5              | ENG                     | Assoc. Prof. Dr. Angelov                                |
| 4     | Spring   | 241117           | Chemical Methods in Mineral Processing and Recycling    | E                  | 3                 | 3                             | 60            | 7              | ENG                     | Prof. Dr. M. Panayotova                                 |
| 2     | Spring   | 281102           | Analytical Chemistry                                    | E                  | 2                 | 3                             | 70            | 8              | ENG                     | Assoc. Prof. Dr. Mintcheva                              |
| 2     | Spring   | 281105           | Hydrochemistry  | E                  | 2                 | 3                             | 56            | 7              | ENG<br>RUS              | Prof. Dr. M. Panayotova, Assist Prof. Dr a. Chanachev   |
| 3     | Spring   | 291107           | Instrumental methods for gas analysis                   | E                  | 2                 | 2                             | 42            | 6              | ENG                     | Assoc. Prof. Dr. Mintcheva                              |
| 2     | Autumn   | 281103           | Organic Chemistry                                       | E                  | 2                 | 4                             | 84            | 7              | ENG                     | Assist. Prof. Dr. Gicheva, Assist Prof. Dr a. Chanachev |

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|-------|----------|------------------|---|--------------------|--------------------------|-------------------------------|---------------|----------------|-------------------------|--|
|       |          |                  |   |                    | Lectures per week        | Exercises / Seminars per week |               |                |                         |  |
| 2     | Autumn   | 281104           | Physical Chemistry                                      | E                  | 2                        | 3                             | 70            | 6              | ENG<br>RUS              | Prof. Dr. M. Panayotova,<br>Assist Prof. Dr a. Chanachev     |
| 4     | Autumn   | 281106           | Protective metal coatings                               | E                  | 2                        | 2                             | 42            | 6              | RUS<br>ENG              | Assoc. Prof. Dr. Kanazirski; Prof. Dr. Panayotova            |
| 4     | Spring   | 281108           | Corrosion and corrosion protection in construction work | E                  | 3<br>(10 weeks semester) | 4<br>(10 weeks semester)      | 70            | 6              | ENG<br>RUS              | Prof. Dr. M. Panayotova                                      |
| 1     | Autumn   | 281101           | General Chemistry                                       | E                  | 2                        | 2                             | 56            | 6              | ENG<br>RUS.<br>GER      | Assoc. Prof. Dr. Kanazirski;<br>Assist Prof. Dr a. Chanachev |
| 3     | Autumn   | 331117           | Microprocessors   | E                  | 2                        | 2                             | 56            | 5              | ENG,<br>RUS             | Assoc. Prof. Dr. Y. Gorbounov                                |
| 2     | Spring   | 331112           | Digital Design  | E                  | 2                        | 3                             | 70            | 6              | ENG,<br>RUS             | Assoc. Prof. Dr. Y. Gorbounov                                |
| 2     | Spring   | 331106           | Fundamentals of Automations                             | E                  | 2                        | 2                             | 56            | 5              | RUS                     | As. V. Dzharov   |
| 2     | Autumn   | 341107           | Electrical materials                                    | E                  | 2                        | 2                             | 56            | 6              | ENG                     | Assoc. Prof. Dr. T. Hristova                                 |
| 2     | Spring   | 341103           | Electrical engineering                                  | E                  | 2                        | 2                             | 56            | 5              | ENG                     | Assoc. Prof. Dr. T. Hristova                                 |
| 3     | Spring   | 111105           | Coal geology  | E                  | 3                        | 3                             | 84            | 7              | ENG                     | Assoc. Prof. Dr. Alexandar Zdravkov                          |
| 3     | Spring   | 111153           | Geology and Geochemistry of Fossil Fuels                | E                  | 2                        | 2                             | 56            | 5              | ENG                     | Assoc. Prof. Dr. Alexandar Zdravkov                          |
| 3     | Autumn   | 111102           | Fundamentals of geochemistry                            | E                  | 3                        | 2                             | 70            | 6              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov                           |
| 3     | Autumn   | 111141           | Geochemistry  | E                  | 2                        | 3                             | 70            | 6              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov                           |
| 4     | Autumn   | 111131           | Industrial Types Deposits of Mineral Resources          | E                  | 2                        | 2                             | 56            | 6              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov                           |

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|-------|----------|------------------|---|--------------------|-------------------|-------------------------------|---------------|----------------|-------------------------|-------------------------------------|
|       |          |                  |   |                    | Lectures per week | Exercises / Seminars per week |               |                |                         |                                     |
| 2     | Spring   | 111118           | Mineral Resources                               | E                  | 2                 | 1                             | 45            | 3              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 3     | Autumn   | 111117           | Geology and Exploration of Mineral Deposits     | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 3     | Spring   | 111104           | Geology of mineral deposits                     | E                  | 3                 | 3                             | 84            | 7              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 4     | Autumn   | 111108           | Deposits of industrial minerals and rocks       | E                  | 3                 | 3                             | 84            | 7              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 1     | Autumn   | 121143           | Prospecting and Exploration of Mineral Deposits | E                  | 3                 | 1                             | 56            | 6              | ENG                     | Assoc. Prof. Dr. Stanislav Stoykov  |
| 4     | Spring   | 111144           | 3D Geological Modelling                         | CA                 | 0                 | 4                             | 406           | 3              | ENG                     | Assoc. Prof. Dr. Kalin Ruskov       |
| 2     | Spring   | 111103           | Fundamentals of geostatistics                   | E                  | 2                 | 2                             | 56            | 6              | ENG                     | Assoc. Prof. Dr. Kalin Ruskov       |
| 3     | Spring   | 112121           | Geographic information systems - GIS            | CA                 | 1                 | 2                             | 42            | 4              | ENG                     | Assoc. Prof. Dr. Kamen Popov        |
| 1     | Spring   | 271116           | Economics                                       | E                  | 3                 | 3                             | 84            | 9              | RUS                     | Prof. Dr. Emil Dimov                |
| 2     | Spring   | 271104           | Economics and Finances                          | E                  | 2                 | 1                             | 42            | 4              | RUS                     | Prof. Dr. Emil Dimov                |
| 4     | Autumn   | 271123           | Entrepreneurship Culture                        | E                  | 3                 | 2                             | 70            | 6              | RUS                     | Assoc. Prof. Dr. Maria Fartunova    |
| 4     | Autumn   | 271102           | Human Resource Management                       | E                  | 3                 | 2                             | 70            | 7              | RUS                     | Assoc. Prof. Dr. Boryana Trifonova  |
| 3     | Spring   | 271122           | Project Management                              | E                  | 3                 | 2                             | 70            | 8              | ENG                     | Assoc. Prof. Dr. Borislava Galabova |

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|       |          |                          |   |                    | Lectures per week | Exercises / Seminars per week |               |                |                         |  |
| 4     | Autumn   | 271225                   | Technology Renewal and Social Dynamics  | E                  | 3                 | 1                             | 56            | 5              | RUS                     | Assoc. Prof. Dr. Maria Fartunova                           |
| 1     | Spring   | 161114<br>161115<br>(CP) | Development and exploitation of oil and gas fields, Part II - Development of oil and gas fields with CP | E                  | 5                 | 5+1(CP)                       | 110           | 9              | ENG, RUS                | Assist. Prof. Dr. Lachezar Nikolov Georgiev                |
| 1     | Spring   | 161116<br>161117<br>(CP) | Transport and Use of the Oil and Gas and CP   | E                  | 5                 | 5+1(CP)                       | 110           | 8              | ENG, RUS                | Assoc. Prof. Dr. Martin Minkov Boyadzhiev                  |
| 1     | Spring   | 161106                   | Machines and Equipment for Oil and Gas Extraction and Transport   | E                  | 2                 | 2                             | 56            | 8              | ENG, RUS                | Assoc. Prof. Dr. Martin Minkov Boyadzhiev                  |
| 1     | Autumn   | 131101                   | Mineralogy and Crystallography  | E                  | 3                 | 3                             | 70            | 6              | ENG<br>RUS              | Assist. Prof. Dr. Dr.Tzankova<br>Assoc. Prof. Dr. Pazderov |
| 1     | Autumn   | 131139                   | Fundamentals of Mineralogy  | E                  | 2                 | 2                             | 56            | 5              | ENG<br>RUS              | Assist. Prof. Dr.Tzankova<br>Assoc. Prof. Dr. Pazderov     |
| 1     | Spring   | 131325                   | Fundamentals of Gemology  | CA                 |                   |                               | 42            | 3              | ENG<br>RUS              | Assist. Prof. Dr.Tzankova                                  |
| 2     | Spring   | 131332                   | Environmental Geochemistry  | CA                 |                   |                               | 56            | 4              | RUS                     | Assoc. Prof. Dr. Pazderov                                  |
| 2     | Spring   | 131103                   | Mineralogy and petrography  | E                  | 3                 | 3                             | 84            | 6              | ENG<br>RUS              | Assist. Prof. Tzankova,<br>Assoc. Prof. Dr. Pazderov       |
| 2     | Spring   | 131104                   | Metamorphic Petrology   | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assoc. Prof. Dr. Pristavova                                |
| 1     | Spring   | 131144                   | Petrography   | E                  | 3                 | 3                             | 84            | 8              | ENG                     | Assoc. Prof. Dr. Pristavova                                |
| 1     | Autumn   | 141101                   | Fundamentals of Geophysics  | E                  | 2                 | 3                             | 70            | 8              | ENG                     | Assoc. Prof. Dr. Maya Tomova                               |
| 3     | Autumn   | 141103                   | Gravitational Methods in Geophysics   | E                  | 4                 | 4                             | 112           | 10             | ENG                     | Assist. Prof. Dr. Christian Tsankov                        |
| 3     | Autumn   | 141106                   | Seismic Methods in Geophysics   | E                  | 4                 | 4                             | 112           | 10             | ENG                     | Assoc. Prof. Dr. Maya Tomova                               |
| 3     | Spring   | 141105                   | Magnetic Methods in Geophysics  | E                  | 4                 | 4                             | 112           | 10             | ENG                     | Assist. Prof. Dr. Christian Tsankov                        |
| 3     | Spring   | 141115                   | Applied Geophysics  | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Prof. DSc. Stefan Dimovski                                 |
| 4     | Autumn   | 141108                   | Remote Sensing Methods in Geophysics  | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assist. Prof. Dr. Christian Tsankov                        |



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|       |          |                  |   |                    | Lectures per week | Exercises / Seminars per week |               |                |                         |  |
| 4     | Spring   | 141109           | Borehole Geophysics   | E                  | 6                 | 6                             | 120           | 12             | ENG                     | Assoc. Prof. Dr. Maya Tomova   |
| 2     | Autumn   | 121153           | Paleontology and Stratigraphy                                 | E                  | 2                 | 3                             | 70            | 8              | ENG                     | Assoc. Prof. Dr. B. Valchev  |
| 1     | Spring   | 121120           | Fundamentals of Cartography                                   | E                  | 2                 | 2                             | 56            | 7              | ENG                     | Assist. Prof. Dr. Valentina Nikolova                                   |
| 2     | Spring   | 121121           | Introduction to geological geometric analysis                 | E                  | 3                 | 3                             | 84            | 8              | ENG                     | Assoc. Prof. Dr. Ivan Dimitrov   |
| 3     | Spring   | 121122           | CAD systems in geology  | CA                 | 1                 | 3                             | 56            | 6              | ENG                     | Assist. Prof. Dr. Dimitar Sachkov                                      |
| 3     | Autumn   | 121125           | Geoinformation analysis of the terrain                        | E                  | 2                 | 2                             | 56            | 5              | ENG                     | Assist. Prof. Dr. Valentina Nikolova                                   |
| 3     | Autumn   | 121150           | GIS and spatial analyses                                      | CA                 | 1                 | 3                             | 56            | 5              | ENG                     | Assist. Prof. Dr. Valentina Nikolova                                   |
| 3     | Autumn   | 121112           | Historic and regional geology                                 | E                  | 3                 | 3                             | 84            | 6              | ENG                     | Assist. Prof. Dr. B. Valchev   |
| 3     | Spring   | 121119           | 3D geological mapping   | E                  | 3                 | 4                             | 98            | 10             | ENG                     | Assoc. Prof. Dr. Ivan Dimitrov   |
| 3     | Autumn   | 121115           | GIS documenting of linear infrastructural objects             | CA                 | 1                 | 4                             | 70            | 7              | ENG                     | Assist. Prof. Dr. Dimitar Sachkov                                      |
| 4     | Autumn   | 121139           | Geological information processing in GIS                      | CA                 | 1                 | 3                             | 56            | 5              | ENG                     | Assist. Prof. Dr. Dimitar Sachkov                                      |
| 4     | Spring   | 121157           | Geological heritage   | E                  | 2                 | 3                             | 50            | 4              | ENG                     | Assist. Prof. Dr. B.Valchev  |
| 4     | Spring   | 111251           | Statistical analysis of geological information                | E                  | 3                 | 3                             | 60            | 4              | ENG                     | Assoc. Prof. Dr. Kalin Ruskov  |
| 3     | Spring   | 351109           | Wärmetechnik = Heat technology and Heat engineering or        | E                  | 3                 | 2                             | 70            | 7              | GE, ENG                 | Assoc. Prof. Dr. E. Kraichev   |
| 3     | Autumn   | 351110           | Thermodynamik= Thermodynamics and Internal Combustion Engines | E                  | 2                 | 2                             | 56            | 6              | GE, ENG                 | Assoc. Prof. Dr. E. Kraichev   |
| 3     | Spring   | 261104           | Mine Ventilation  | E                  | 2                 | 2                             | 60            | 4              | ENG, German             | Assist. Prof. Nadezhda Kostadinova, PhD<br>Assoc. Prof. Zahari Dinchev |

| Year* | Semester          | Course unit code | Full name of the course unit                       | Form of assessment | Workload          |                               | Overall hours | Credits (ECTS) | Language of instruction                  | Course leader  |
|-------|-------------------|------------------|--|--------------------|-------------------|-------------------------------|---------------|----------------|--|--|
|       |                   |                  |  |                    | Lectures per week | Exercises / Seminars per week |               |                |  |  |
| 4     | Spring            | 261102           | Occupational Health and Safety                     | E                  | 2                 | 2                             | 60            | 4              | ENG, German                              | Assoc. Prof. Dr. Blagovesta Vladkova, Assist. Prof. Dr. Dobri Dobrev |
| 2     | Autumn            | 361111           | Computer Networks and Communications – Part I      | E                  | 2                 | 3                             | 70            | 7              | ENG                                      | Assoc. Prof. Dr. Veselin Hristov, Assist. Prof. Kremend Arsova       |
| 4     | Spring            | 361126           | Protecting of Information and Information Security | E                  | 3                 | 3                             | 60            | 7              | ENG                                      | Assoc. Prof. Dr. Yordanka Anastasova, Assist. Prof. Ivan Drankov     |
|       | Autumn/<br>Spring | 221100           | Foreign language                                   | CA                 | -                 | 3                             | 42            | 3              | English, French, German Spanish, Russian | Chief Assist. M. Hristova - head of the foreign languages dept.      |
| 3     | Autumn            | 321101           | Electrical Apparatus                               | E                  | 2                 | 3                             | 70            | 6              | RUS                                      | Assoc. Prof. PhD Kiril Stalinov Dzhustrov                            |
| 4     | Autumn            | 321135           | Relay Protection                                   | E                  | 2                 | 3                             | 70            | 5              | RUS                                      | Assoc. Prof. PhD Kiril Stalinov Dzhustrov                            |
| 4     | Autumn            | 321109           | Explosive electrical equipment production          | E                  | 2                 | 2                             | 56            | 4              | RUS                                      | Assoc. Prof. PhD Kiril Stalinov Dzhustrov                            |
| 3     | Spring            | 231101           | Underground Construction                           | E                  | 2                 | 3                             | 42            | 6              | GER                                      | Prof. PhD Pavel Pavlov   |
| 4     | Spring            | 231119           | Tunnelling Mine Construction                       | E                  | 3                 | 4                             | 40            | 6              | GER                                      | Prof. PhD Pavel Pavlov   |
| 3     | Autumn            | 231120           | Construction of Underground Facilities             | E                  | 2                 | 1                             | 45            | 3              | GER                                      | Prof. PhD Pavel Pavlov   |
| 3     | Autumn            | 231115           | Blasting Equipment and Technology                  | E                  | 3                 | 3                             | 84            | 7              | ENG                                      | Prof. PhD Valery Mitkov  |
| 3     | Autumn            | 231114           | Structural Mechanics of Underground Equipment      | E                  | 3                 | 2                             | 70            | 5              | ENG                                      | Assoc. Prof. PhD Ivan Mitev  |
| 4     | Autumn            | 231104           | Underground Urban Infrastructure                   | E                  | 3                 | 3                             | 84            | 7              | ENG                                      | Assoc. Prof. PhD Ivan Mitev  |
| 3     | Spring            | 231109           | Soil Mechanics and Foundation                      | E                  | 3                 | 4                             | 98            | 9              | ENG                                      | Assoc. Prof. PhD Ivan Mitev  |
| 3     | Spring            | 231122           | Mine Construction                                  | E                  | 2                 | 3                             | 42            | 7              | ENG                                      | Ch. Assist. PhD Veselin Balev  |
| 2     | Spring            | 351136           | Rock Mechanics                                     | E                  | 2                 | 2                             | 56            | 5              | ENG                                      | Ch. Assist. PhD Veselin Balev  |
| 3     | Autumn            | 231115           | Blasting Equipment and Technology                  | E                  | 3                 | 3                             | 84            | 7              | ENG                                      | Ch. Assist. PhD Zdravka Mollova                                      |
| 4     | Autumn            | 231111           | Reinforced Concrete                                | E                  | 3                 | 2                             | 70            | 6              | ENG                                      | Assist. PhD Rafail Rafailov  |
| 4     | Autumn            | 231171           | Course project in Reinforced Concrete              | E                  |                   | 1                             | 14            | 2              | ENG                                      | Assist. PhD Rafail Rafailov  |
| 3     | Autumn            | 231114           | Structural Mechanics of Underground Equipment      | E                  | 3                 | 2                             | 70            | 6              | ENG                                      | Assist. Vladimir Penev   |
| 3     | Spring            | 231109           | Soil Mechanics and Foundation                      | E                  | 3                 | 4                             | 98            | 9              | ENG                                      | Assist. Vladimir Penev   |

\* According to the curriculum of the University of Mining and geology; ENG = English; RUS = Russian; GE = German; E = Exam; CA = Continuous assessment

## Practical trainings at Bachelor level

| Year* | Course unit code | Full name of the course unit                              | Form of assessment | Workload<br>Overall hours | Hours | Language of instruction | Course leader                       |
|-------|------------------|---|--------------------|---------------------------|-------|-------------------------|-------------------------------------|
| 2     | 121128           | Paleontology and Stratigraphy                             | CA                 | 3 days                    | 18    | ENG                     | Assist. Prof. Dr. B.Valchev         |
| 2     | 121129           | Structural geology and Geotectonics                       | CA                 | 3 days                    | 18    | ENG                     | Assoc. Prof. Dr. Ivan Dimitrov      |
| 3     | 121130           | Field geology   | CA                 | 10 days                   | 60    | ENG                     | Assoc. Prof. Dr. Ivan Dimitrov      |
| 3     | 121149           | Regional geology and geological phenomena                 | CA                 | 8 days                    | 48    | ENG                     | Assist. Prof. Dr. B. Valchev        |
| 3     | 141124           | Practical Training in Gravitational Methods in Geophysics | CA                 | 3 days                    | 18    | ENG                     | Assist. Prof. Dr. Christian Tsankov |
| 3     | 141126           | Practical Training in Magnetic Methods in Geophysics      | CA                 | 3 days                    | 18    | ENG                     | Assist. Prof. Dr. Christian Tsankov |
| 3     | 141127           | Practical Training in Seismic Methods in Geophysics       | CA                 | 3 days                    | 18    | ENG                     | Assoc. Prof. Dr. Maya Tomova        |
| 3     | 141128           | Practical Training in Applied Geophysics                  | CA                 | 3 days                    | 18    | ENG                     | Assist. Prof. Dr. Christian Tsankov |

\* According to the curriculum of the University of Mining and geology; ENG = English; RUS = Russian

## **MASTER PROGRAMS THAT CAN BE TAUGHT IN ENGLISH**

**Name of the program:** *ECOTECHNOLOGY AND ENVIRONMENTAL PROTECTION*

**EQF Level of the program:** 7

**The ISCED 2013 field of education:** 052

**Qualification awarded:** *ECOLOGIST*

### **Description of the program:**

*The Master's Programme in "Ecotechnologies and Environmental Protection" prepares for future career highly qualified specialists ready to meet the contemporary challenges of the industry and society. In addition to the solid academic knowledge, the programme allows to the students to develop a variety of practical skills outside of the university thanks to our close partnerships with authoritative and international companies in the branch. The senior graduate students who chose this specialty will be trained in the environmental impact of the energy and mineral industry sectors on the environment as well as in the implementation of efficient and environmental friendly ecotechnological solutions, adapted to the local social conditions for sustainable industrial development and economic growth. The programme covers varied aspects of the latest methods of the sustainable engineering that can reduce the damage on the ecosystems, remediate the polluted water and soil, manage the wastes and ensure conservation of the biodiversity. All kinds of manufactures wish to hire such specialists, because all of these manufactures must satisfy strict environmental regulations and be sure that they deal with the best eco-friendly practices. The educational approach is multidisciplinary, involving close cooperation between European and world-famous scientists with high reputation, together with a numerous experts and representatives of the business society. Graduates of this specialty can find jobs as experts-ecologist in various industries, at the market for ecotechnology and environmental innovations, in the scientific and governmental institutions in the member countries of European Union as well as in the whole world.*

### **Key learning outcomes:**

This Master's degree expands students' knowledge and this is facilitated by the opportunity to obtain specialised training in some of the above subjects by selecting the respective set of optional course units. The graduates of this degree are able to design and organise environmental protection activities and to exert administrative control in this direction, as well as to perform as engineers and ecologists in various branches of industry and agriculture, as experts in state institutions, non-governmental organisations, and commercial entities acting in the area of ecology and environmental protection, and also as research workers in the field of ecology and environmental protection. Training in this degrees is carried out along curricula that comply with those of the leading universities of EU member states.

The graduates of this course of studies can be successfully employed on positions connected with environmental protection activities in the geoexploration, mining, and energy branches of industry, in the chemical and pharmaceutical industries and in agriculture, as well as such in the field of mineral processing. They can also find occupational fulfilment as ecologists in district authorities and municipalities, in the Regional Inspectorate of the Environment and Water (RIEWs), or as state employees in institutions whose scope of power is ecology.

**Leading department:** *Department Engineering Geoecology*

**Program director:** *Assoc. Prof. A. Angelov, PhD*

**Contacts:** *University of Mining and Geology "St. Ivan Rilski"  
Studentski Grad, "Prof. Boyan Kamenov" Street, Sofia 1700, [tonyagev@mgu.bg](mailto:tonyagev@mgu.bg)*

## Program components, workload, assessment methods, credits allocation

| Year   | Semester            | Code of the discipline                | Full name of the discipline  | Form of assessment  | Weekly workload |                     | Overall hours | Credits (ECTS) |    |
|--------|---------------------|---------------------------------------|--|---------------------|-----------------|---------------------|---------------|----------------|----|
|        |                     |                                       |  |                     | Lectures        | Exercises /Seminars |               |                |    |
| First  | Autumn              | 172127                                | <u>Compulsory:</u><br>1. Environmental chemistry                         | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     | 292115                                | 2. Impact of mining and mineral processing on natural water bodies       | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     | 121159                                | 3. Environmental Geology   | Exam                | 2               | 2                   | 60            | 5,0            |    |
|        |                     | 142145                                | 4. Environmental Geophysics  | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     |                                       | <u>5. Elective (one of the two):</u>                                     |                     |                 |                     |               |                |    |
|        |                     | 272172                                | 5.1. Management of environmental impacts                                 | Exam                | 3               | 1                   | 60            | 5,0            |    |
|        |                     | 271162                                | 5.2. Economic assessment of environmental impacts                        | Exam                | 3               | 1                   | 60            | 5,0            |    |
|        |                     |                                       | <i>Total for the first semester:</i>                                     |                     |                 | 14                  | 12            | 390            | 28 |
|        | Spring              |                                       |  | <u>Compulsory :</u> |                 |                     |               |                |    |
|        |                     | 172173                                | 6. Waste management  | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     | 172174                                | 7. Biotechnological systems for environmental protection                 | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     | 112161                                | 8. Environmental Geochemistry  | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     | 362117                                | 9. Geocological modelling in a GIS environment                           | Exam                | 3               | 3                   | 90            | 6,0            |    |
|        |                     |                                       | <u>10. Elective (one of the two):</u>                                    |                     |                 |                     |               |                |    |
| 172158 |                     | 10.1. Biosensors and bioindicators    | Exam   | 3                   | 3               | 90                  | 6,0           |                |    |
| 172168 | 10.2. Ecotoxicology | Exam                                  | 3  | 3                   | 90              | 6,0                 |               |                |    |
|        |                     | <i>Total for the second semester:</i> |  |                     | 15              | 15                  | 450           | 36             |    |
| Second | Autumn              |                                       | Pre-graduate practice and Master Thesis defence                          |                     |                 |                     | 30            | 15             |    |
|        |                     |                                       | <i>Total number of hours and credits for the entire training course:</i> |                     |                 |                     | 870           | 85             |    |

**Name of the program: GEOLOGY AND GEOINFORMATICS**

**EQF Level of the program: 7**

**The ISCED 2013 field of education: 0532**

**Qualification awarded: Master in geoinformatics**

**Description of the programme:**

*This master's program is centered around the use of geoinformatics in earth science fields. It is particularly relevant to the subject of environmental geology. The programme prepares students to become experts in geological prospecting and ecological research with emphasis on soil and water management. The courses are designed to teach, complex geological and geomorphological analyses using software tools, documentation of infrastructure sites, mapping of the geochemical and geophysical parameters of the environment, computer modeling of natural processes, forecasting and monitoring of natural risks and procedures for management of protected areas, such as national parks, geoparks and etc. They are designed to develop abilities, useful for doctoral studies, and/or professional career in the industry. Since the main tool used is GIS software, upon completion of the program, the candidates will be most sought of as GIS specialists in mining and prospecting companies and as variety of GIS related technicians in environment related business enterprises.*

**Key learning outcomes:**

By the end of this Master programme graduates will be able to:

- Define and comprehend fundamental concepts, practices and advances in geoinformatics;
- Acquire, process and visualize spatial data in the field of geology, environmental protection and geotourism;
- Know and analyse spatial and functional dependencies between objects and phenomena (particularly related to geological prospecting; geodynamic events; geological-geomorphological hazards and protected areas) and to interpret the results of the analysis;
- Do individual researches for solving different tasks in geology, environmental protection and landscapes;
- Know main remote sensing systems and apply remote sensing methods;
- Apply techniques of spatial analyses, 3D modelling and mapping;
- Demonstrate confidence in working with GIS and in solving of different software problems by using software help or information in the websites;
- Show advanced skills in using computer technology for input and analysis of spatial data;
- Demonstrate organizational skills in file and database management;
- Effectively communicate the results of their research and master's theses

**Leading department:**

***Geology and geoinformatics***

**Program director**

***Assoc. Prof. Ivan Dimitrov Ivanov***

**Contacts: *University of Mining and Geology "St. Ivan Rilski"*  
*Studentski Grad, "Prof. Boyan Kamenov" Street, Sofia 1700,*  
[\*ldim68@abv.bg\*](mailto:ldim68@abv.bg), ***Assoc. Prof. Ivan Dimitrov Ivanov*****

## Program components, workload, assessment methods, credits allocation

| Semester                             | No | Course unit code | Full name of the course unit                      | Form of assessment | Workload |                     | Workload Exercises Types |            |           | Overall hours | Credits (ECTS) |
|--------------------------------------|----|------------------|---|--------------------|----------|---------------------|--------------------------|------------|-----------|---------------|----------------|
|                                      |    |                  |   |                    | Lectures | Exercises /Seminars | Seminar                  | Lab        | Practical |               |                |
| Autumn                               | 1  | 112146           | GIS analysis in geological prospecting            | E                  | 2        | 3                   |                          | 45         |           | 75            | 6              |
|                                      | 2  | 122141           | GIS documenting and management of protected areas | E                  | 2        | 3                   |                          | 30         | 15        | 75            | 6              |
|                                      | 3  |                  | <u>Elective course:</u>                           |                    |          |                     |                          |            |           |               |                |
|                                      |    | 122218           | 1. Special methods of 3D geological analysis      | E                  | 2        | 3                   |                          | 30         | 15        | 75            | 6              |
|                                      |    | 122216           | 2. Geodynamic processes and events                |                    |          |                     | 45                       |            |           |               |                |
|                                      | 4  | 172126           | Ecology and environmental protection              | E                  | 2        | 3                   |                          | 45         |           | 75            | 6              |
|                                      | 5  |                  | <u>Elective course:</u>                           |                    |          |                     |                          |            |           |               |                |
|                                      |    | 122242           | 1. Application of GIS in landscape studies        | CA                 | 1        | 4                   |                          | 60         |           | 75            | 6              |
|                                      |    | 122243           | 2. Spatial data infrastructure                    |                    |          |                     |                          |            |           |               |                |
|                                      |    |                  | <u>Optional:</u>                                  |                    |          |                     |                          |            |           |               |                |
|                                      |    | 222301           | English   |                    |          | 28                  | 28                       |            |           | 28            |                |
|                                      |    | 372300           | Physical education and sport                      |                    |          | 28                  |                          |            | 28        | 28            |                |
| <b>Total for the first semester</b>  |    |                  |   | <b>4+1</b>         | <b>9</b> | <b>16</b>           | <b>45</b>                | <b>200</b> | <b>30</b> | <b>375</b>    | <b>30</b>      |
| Spring                               | 6  | 112124           | Remote sensing in geology                         | E                  | 2        | 3                   |                          | 45         |           | 75            | 5              |
|                                      | 7  | 122117           | Geological maps compilation in GIS                | CA                 | 1        | 4                   |                          | 60         |           | 75            | 5              |
|                                      | 8  | 142143           | Digital images processing                         | E                  | 1        | 4                   |                          | 60         |           | 75            | 5              |
|                                      | 9  | 122144           | Geoecological modeling in GIS environment         | E                  | 1        | 4                   |                          | 60         |           | 75            | 5              |
|                                      | 10 | 122145           | Basics of scientific research                     | E                  | 2        | 3                   | 45                       |            |           | 75            | 5              |
|                                      | 11 |                  | <u>Elective course:</u>                           |                    |          |                     |                          |            |           |               |                |
|                                      |    | 362233           | 1. Web programming                                | CA                 | 1        | 3                   |                          | 45         |           | 60            | 5              |
|                                      |    | 122246           | 2. Programming in GIS environment                 |                    |          |                     |                          |            |           |               |                |
|                                      |    |                  | <u>Optional:</u>                                  |                    |          |                     |                          |            |           |               |                |
|                                      |    | 222301           | English   |                    |          | 28                  | 28                       |            |           | 28            |                |
|                                      |    | 372300           | Physical education and sport                      |                    |          | 28                  |                          |            | 28        | 28            |                |
| <b>Total for the second semester</b> |    |                  |   | <b>4+2</b>         | <b>7</b> | <b>22</b>           |                          | <b>330</b> |           | <b>435</b>    | <b>30</b>      |
|                                      |    | 122132           | Preparation and defense of a thesis               |                    |          |                     |                          |            |           |               | 15             |

## PHD PROGRAMS THAT CAN BE TAUGHT IN ENGLISH

**Name of the program: SYSTEMS AND DEVICES FOR ENVIRONMENTAL PROTECTION**

**EQF Level of the program: 8**

**The ISCED 2013 field of education: 052 Environment**

**Qualification awarded: PhD**

**Description of the program:**

*The international PhD course in „Systems and devices for environmental protection“ at the University of Mining and Geology „St. Ivan Rilski“-Sofia, Bulgaria prepares for future careers motivated specialists in ecology and ecological biotechnology, who are interested particularly in the modern environmental challenges of the industry and society. In addition to the solid professional knowledge, the program training allows to develop a variety of practical skills for the searching of best and applicable engineering solutions of various problems related to the environmental protection and conservation. The PhD fellows involved in this specialty will be educated in the impact of the energy and mineral industries on the environment, the biosensors technology and analytical tools for ecological monitoring and assessment, as well as the preparation of scientific reports and set of efficient strategies for sustainable industrial growth and economic development.*

**Key learning outcomes:**

The general key learning outcomes of the course program are the possibilities for management of numerous types of system and devices, which are widely used to improve and keep in good health the natural ecosystems in conditions of industrialization, where the processes are conducted with high risk of potential release of wastes and toxicants. Thus, the graduates have a broad scopes for finding jobs, as highly qualified experts in many industrial branches, researchers in academic or scientific institutions, non-profit organizations, advisors in governmental institutions, mainly in European Union but also in the other countries, which require high standarts for environmental protection and control.

**Leading department: Department Engineering Geoecology**

**Program director: Assoc. Prof. A. Angelov, PhD**

**Contacts: University of Mining and Geology “St. Ivan Rilski”, Studentski Grad, “Prof. Boyan Kamenov” Street, Sofia 1700, [tonyagev@mgu.bg](mailto:tonyagev@mgu.bg)**



**Name of the program: METHODS AND TECHNIQUE OF GEOLOGICAL STUDIES**

**EQF Level of the program: 8**

**The ISCED 2013 field of education: 0532 Earth Sciences**

**Qualification awarded: PhD**

**Description of the program:**

*The PhD program in the scientific specialty “Methods and Technique of Geological Studies” at the Department of Applied Geophysics is designed to prepare highly qualified specialists in the field of structural geological-geophysical studies related to the prospecting, exploration and exploitation of mineral resources. At the University of Mining and Geology “St. Ivan Rilski”, unlike other PhD programs that are related to fundamental geophysical and geological subjects, the efforts are mainly focused on solving problems directly related to the implementation of state and/or corporate projects, focusing the specifics in preparation and training of PhD students, first and foremost, in practical terms. Particular attention is paid to the near-surface geophysical studies in industrial, civil and mining construction.*

*The PhD students receive the necessary theoretical and practical training, perfecting and concentrating their knowledge in the possibilities for application of field, borehole and remote geophysical methods in all stages of prospecting, exploration and exploitation of mineral resources, as well as in solving engineering, hydrogeological and environmental problems.*

*Graduates of the PhD program in the scientific specialty "Methods and Technique of Geological Studies" at the Department of Applied Geophysics find professional realization in the design and conduct of geophysical research in the mentioned fields, as well as in fields with close or similar activity. They can work in scientific and scientific-designing institutes and laboratories, in universities as lecturers and associates. They can apply for leading positions as executives or experts in proper state and economic structures, or successfully implement themselves through their knowledge in modern computer technology.*

**Key learning outcomes:**

The PhD candidate acquires problem solving ability and ability to work in a team environment, comprising specialists of various expertise.

This is achieved by solving real problems of both scientific and practical importance, related to some geological or environmental procedure, which reflects societal needs, such as mineral prospecting and mitigation of environmental damage, water management or soil management. The problem solving is projected in a time frame that is sufficient to accomplish extensive literatures review, data acquisition, analysis and presentation of the results. The presentation of the results is achieved by paper writing and thesis completion and defense.

The main problem, solved in the PhD program, is selected to be of multidisciplinary nature so interaction with specialists of different field is needed on every step of the work flow.

These specialists, acting as consultants, are selected from the pool of the University of Mining and Geology - Sofia, the Sofia University and the institutes of the Bulgarian Academy of Sciences. Training courses, workshops and laboratory time in relevant European universities are also envisaged. Acquaintance with and industry executives from relevant fields will most likely be made as some point in the program.

As an obligatory outcome at least three scientific papers have to be published as in one of them the candidate should be the sole author.

In addition to the problem-solving, adequate skills in scientific presentation of the results are also specifically targeted in the learning program. The presentation will encompass oral, writing and graphic presentation skills. The graphic presentation usually includes high level 3D visualization using GIS or CAD software, coupled with geometry methods from the fields of geodesy, structural geology and other earth sciences.

As a rule the PhD program has three obligatory exams as the number of exams can be increased depending on the topic and the needs of the candidate. One of these exams is in technical English, for nonnative English speakers, and the rest are on topics strictly related to the topic of the thesis.

Socialization in the Bulgarian environment is usually achieved by using accommodation on the student's town in Sofia, where other students and young people live.

**Leading department**  
***Geology and geoinformatics***

**Program director**  
***Ass. Prof. Ivan Dimitrov Ivanov***

**Contacts: *University of Mining and Geology "St. Ivan Rilski", Studentski Grad, "Prof. Boyan Kamenov" Street, Sofia 1700, [ldim68@abv.bg](mailto:ldim68@abv.bg), Assoc. Prof. Ivan Dimitrov Ivanov***

**Name of the program: *COMPUTER TECHNOLOGY IN ENGINEERING***

**EQF Level of the program: 8**

**The ISCED 2013 field of education: 06 Information and Communication Technologies**

**Qualification awarded: PhD**

**Description of the program:**

*The doctoral program develops skills that allow students to become experts with integrated technical, information and management training for mining and other industries, combining knowledge and skills in the following main areas of application of information and computer technology: development strategy, innovation, information service and implementation of modern computer systems for monitoring and management in the industry.*

*Successfully defended doctoral students can solve a wide range of information and management tasks in a globalizing market economy, characterized by a dynamically changing environment, significant risk in the implementation of complex information systems, the constant movement of raw material prices and limited resources, developed competition: wide application of computer and information technologies and the urgent need for restructuring and integration of the economy in the international economic space.*

**Key learning outcomes:**

The intellectual qualities and practical skills that are acquired during the training of doctoral students are related to:

- deepening the knowledge related to the modern theoretical and methodological principles for research in the scientific fields, related to the application and finding of specific computer technological and technical solutions and information management technologies in the organization and management of processes;
- study, introduction and optimization of new and constantly evolving technologies, methods, techniques and tools in computer, communication and information technologies and their application in specific business organizations;
- study and introduction of new, more progressive and sophisticated approaches, techniques and tools and introduction of innovative technological computerized solutions;
- formation of initiative, innovation, competence and complex skills for conducting independent research and experimental activities, as well as knowledge and skills for independent research and teaching activities;
- Achieving very good theoretical and applied preparation for participation in national, international and regional scientific forums, competitions and projects.

In the process of training doctoral students master not only the specific approaches, methods, principles and techniques in information and computer technology, but also can choose the best ones for solving specific problems in the respective business organizations.

**Leading department: *Department of Informatics***

**Program director**

***Assoc. Prof. PhD Nikolay Ivanov Yanev***

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## PROGRAMS AND COURSES THAT ARE TAUGHT IN BULGARIAN

### EQF Level 6 "Bachelor"

<https://mgu.bg/en/bachelors-degree-programmes/>

### EQF Level 7 "Master"

<https://mgu.bg/en/masters-programmes/>

### EQF Level 8 "Doctorate or equivalent third cycle"

<https://mgu.bg/en/doctoral-programmes/>

## INFORMATION ON THE GRADING SYSTEM USED IN BULGARIA

### Grading scale:

EXCELLENT (5.50 - 6.00) - outstanding performance with only minor errors

VERY GOOD (4.50 - 5.49) - above the average standard but with some errors

GOOD (3.50 - 4.49) - generally sound work with a number of notable errors

FAIR (3.00 - 3.50) - performance meets the minimum criteria

FAIL (2.00) - considerable further work is required

### ECTS grading scale:

| Bulgarian - ECTS   | Bulgarian - ECTS  | Bulgarian - ECTS  | Bulgarian - ECTS  | Bulgarian - ECTS  | Bulgarian - ECTS  |
|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <b>6.00 - A100</b> | <b>5.50 - A90</b> | <b>5.00 - B80</b> | <b>4.50 - B70</b> | <b>4.00 - C60</b> | <b>3.50 - C50</b> |
| 5.95 - A 99        | 5.45 - B89        | 4.95- - B79       | 4.45 - C69        | 3.95 - C59        | 3.45 - D49        |
| 5.90 - A98         | 5.40 - B88        | 4.90 - B78        | 4.40 - C68        | 3..90- C58        | 3.40 - D48        |
| 5.85 - A97         | 5.35 - B87        | 4.85- B77         | 4.35 - C67        | 3.85 - C57        | 3.35 - D47        |
| 5.80 - A96         | 5.30 - B86        | 4.80- B76         | 4.30 - C66        | 3.80 - C56        | 3.30 - D46        |
| 5.75 - A95         | 5.25 - B85        | 4.75- B75         | 4.25 - C65        | 3.75 C55          | 3.25 - D45        |
| 5.70 - A94         | 5.20 - B84        | 4.70- B74         | 4.20 - C64        | 3.70 - C54        | 3.20 - D44        |
| 5.65 - A93         | 5.15 - B83        | 4.65- B73         | 4.15 - C63        | 3.65 - C53        | 3.15 - D43        |
| 5.60- A92          | 5.10 - B82        | 4.60- B72         | 4.10 - C62        | 3.60 - C52        | 3.10 - D42        |
| 5.55 - A91         | 5.05 - B81        | 4.55- B71         | 4.05 - C61        | 3.55 - C51        | 3.05 - D41        |
|                    |                   |                   |                   |                   | <b>3.00 - E40</b> |

## ACADEMIC CALENDAR 2023-2024

### Bachelor

#### ***Autumn semester - 2023***

|                           |                    |
|---------------------------|--------------------|
| Classes begin             | September 11, 2023 |
| Add/drop week ends (5 pm) | September 18, 2023 |
| Classes end               | December 22, 2023  |
| Exams beginning           | January 8, 2024    |
| Exams end                 | January 26, 2024   |

#### ***Spring semester - 2024***

|                              |              |
|------------------------------|--------------|
| Classes begin                | January 29   |
| Add/drop week ends (5 pm)    | February 5   |
| Classes end                  | May 17       |
| Exams beginning              | May 20       |
| Exams end                    | June 9       |
| Correctional session         | June 10 - 16 |
| <i>Educational practices</i> | June 17 - 30 |

### **Master**

#### ***Autumn semester - 2023***

|                           |                   |
|---------------------------|-------------------|
| Classes begin             | October 16, 2023  |
| Add/drop week ends (5 pm) | October 23, 2023  |
| Classes end               | January 26, 2024  |
| Exams beginning           | January 29, 2024  |
| Exams end                 | February 16, 2024 |

#### ***Spring semester - 2024***

|                           |             |
|---------------------------|-------------|
| Classes begin             | February 19 |
| Add/drop week ends (5 pm) | February 26 |
| Classes end               | May 31      |
| Exams beginning           | June 3      |
| Exams end                 | June 9      |

### **Vacations and holidays**

Unification Day - September 6  
Independence Day - September 22  
Day of the Bulgarian Enlighteners (Holiday for all educational institutions) – November 1  
Day of the patron of the university (no classes) - October 19  
Students' holiday (no classes) - December 8  
Christmas holidays - December 23 - January 7  
National Holiday /Bulgaria's Liberation from the Ottoman Empire/ – March 3  
Easter holidays - May 1 - 6  
Labour and International Worker's Solidarity Day - May 1  
St. George's Day and the Bulgarian Army's Day - May 6  
Bulgarian Education and Culture, and Slavic Script Day - May 24