

## University of Miskolc

### Earth Sciences Engineering master program

- Programme title: **Earth Sciences Engineering master program (MSc)**
- Degree awarded: **Earth Sciences Engineer**
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- minor specializations:
  - Geological Engineering module,
  - Geophysical Engineering module,
  - Geoinformatics Engineering module.
- Number of semesters: 4; number of contact hours: 1380; required number of credits to be completed: 120
- Field practice: Minimum 4 weeks internship at a mining company, research institute or competent authority.

| <b>Programme overview</b>  |   |              |              |       |       |      |            |                         |
|--|---|--------------|--------------|-------|-------|------|------------|-------------------------|
| <b>General courses</b> (Basic subjects from natural sciences – NS; Economic and human subjects – EH; Basic professional subjects – PS) |   |              |              |       |       |      |            |                         |
| semester   | course  | subjectgroup | code         | Lect. | Prac. | ECTS | assignment | lecturer                |
| 1  | Numerical methods and optimization              | NS           | GEMAK712MA   | 1     | 1     | 2    | P          | Dr. Körei Attila        |
| 1  | Engineering physics                             | NS           | MFGFT7100011 | 2     | 1     | 4    | E          | Dr. Dobróka Mihály      |
| 1  | Physical geology                                | NS           | MFFTT710001  | 2     | 1     | 4    | E          | Dr. Hartai Éva          |
| 1  | Mineralogy and geochemistry                     | NS           | MFFAT710005  | 2     | 1     | 4    | E          | Dr. Zajzon Norbert      |
| 1  | Geodesy, spatial informatics                    | NS           | MFGGT710002  | 2     | 1     | 4    | E          | Dr. Bartha Gábor        |
| 1  | Computer science for engineers                  | NS           | GEMAK713MA   | 0     | 2     | 2    | P          | Dr. Körei Attila        |
| 1  | Geophysical exploration methods I.              | PS           | MFGFT7100021 | 2     | 1     | 4    | E          | Dr. Szabó Norbert Péter |
| 1  | Data and information processing                 | PS           | MFGFT7100031 | 2     | 1     | 4    | P          | Dr. Dobróka Mihály      |
| 1  | Graduate research seminar                       | EH           | MFFAT710006  | 0     | 2     | 2    | P          | Dr. Máday Ferenc        |
| <b>Basic professional subjects</b>   |   |              |              |       |       |      |            |                         |
| 2  | Structural geology                              | PS           | MFFAT720020  | 1     | 2     | 4    | E          | Dr. Németh Norbert      |
| 2  | Mineral deposits                                | PS           | MFFTT720021  | 2     | 1     | 4    | E          | Dr. Földessy János      |
| 2  | Engineering geology and hydrogeology            | PS           | MFKHT720020  | 2     | 1     | 4    | E          | Dr. Szűcs Péter         |
| 2  | Analytical technics in mineralogy and petrology | PS           | MFFAT720025  | 1     | 1     | 2    | P          | Dr. Zajzon Norbert      |

| semester   | course  | subjectgroup | code               | Lect. | Prac. | ECTS | assignment | lecturer                       |
|--|---|--------------|--------------------|-------|-------|------|------------|--------------------------------|
| 3  | Geological interpretation and prospecting                 | PS           | MFFAT730026        | 2     | 2     | 4    | E          | Dr. Földessy János             |
| 3  | Geophysical interpretation and prospecting                | PS           | MFGFT730025        | 2     | 2     | 4    | E          | Dr. Takács Ernő                |
| 3  | Quality management  | EH           | GTVVE7002MA        | 2     | 0     | 2    | P          | Dr. Berényi László             |
| 3  | Legal and economic studies for mining and geology         | EH           | MFFTT730027        | 2     | 0     | 2    | E          | Dr. Máдай Ferenc               |
| 3  | Diploma thesis consultation 1.                            |              |                    |       |       | 6    |            |                                |
| 4  | Strategic Management                                      | EH           | GTVVE7041MA        | 2     | 0     | 2    | E          | Dr. Balaton Károly             |
| 4  | Safety techniques and labor safety                        | EH           |                    | 2     | 0     | 2    | E          | Dr. Zákányiné Mászáros Renáta  |
| 4  | Diploma thesis consultation 2.                            |              |                    |       |       | 24   |            |                                |
| <b>Geophysical engineering module (Specific professional subjects - SPS)</b> |   |              |                    |       |       |      |            |                                |
| 2  | Geophysical measurements                                  | SPS          | MFGFT720012        | 2     | 1     | 4    | E          | Dr. Vass Péter                 |
| 2  | Engineering and environmental geophysics                  | SPS          | MFGFT720013        | 2     | 1     | 4    | P          | Dr. Szabó Norbert Péter        |
| 2  | Engineering physics II.                                   | SPS          | MFGFT720011        | 1     | 1     | 2    | E          | Dr. Dobróka Mihály             |
| 2  | Geophysical inversion                                     | SPS          | MFGFT720014        | 1     | 1     | 2    | E          | Dr. Dobróka Mihály             |
| 2  | Geophysical exploration methods II.                       | SPS          | MFGFT720015        | 2     | 1     | 4    | E          | Dr. Vass Péter                 |
| 3  | Geophysical data processing                               | SPS          | MFGFT730026        | 2     | 2     | 4    | E          | Dr. Turai Endre                |
| 3  | Global environmental geophysics                           | SPS          | MFGFT730027        | 1     | 1     | 2    | E          | Dr. Pethő Gábor                |
| 3  | Elective course I.  | EL           |                    | 2     | 2     | 4    | E          |                                |
|  | <i>Geoelectric lectureship</i>                            |              | <i>MFGFT730031</i> |       |       |      |            | <i>Dr. Turai Endre</i>         |
|  | <i>Geostatistics</i>                                      |              | <i>MFGFT730017</i> |       |       |      |            | <i>Dr. Szabó Norbert Péter</i> |
|  | <i>Seismic college</i>                                    |              | <i>MFGFT730029</i> |       |       |      |            | <i>Dr. Gombár László</i>       |
|  | <i>Well-logging college</i>                               |              | <i>MFGFT730030</i> |       |       |      |            | <i>Dr. Vass Péter</i>          |
| 3  | Elective course II.                                       | EL           |                    | 1     | 1     | 2    | E          |                                |
|  | <i>Introduction to the English Geophysical Literature</i> |              | <i>MFGFT730041</i> |       |       |      |            | <i>Dr. Szabó Norbert Péter</i> |

| semester  | course                           | subjectgroup | code        | Lect. | Prac. | ECTS | assignment | lecturer                 |
|---|----------------------------------|--------------|-------------|-------|-------|------|------------|--------------------------|
|   | <i>Engineering programming</i>   |              | MFGFT73011A |       |       |      |            | Dr. Vass Péter           |
| <b>Geological engineering module (Specific professional subjects - SPS)</b> |                                  |              |             |       |       |      |            |                          |
| 2   | Historical geology               | SPS          | MFFTT720028 | 2     | 1     | 4    | E          | Dr. Less György          |
| 2   | Hydrocarbon geology              | SPS          | MFFAT720029 | 2     | 0     | 2    | E          | Dr. Velledits Felicitász |
| 2   | Geological mapping               | SPS          | MFFTT720029 | 1     | 2     | 4    | P          | Dr. Less György          |
| 2   | Sedimentology                    | SPS          | MFFAT720030 | 1     | 1     | 2    | P          | Dr. Velledits Felicitász |
| 2   | Geochemical prospecting methods  | SPS          | MFFAT720031 | 1     | 2     | 4    | P          | Dr. Má dai Ferenc        |
| 3   | Non-metallic industrial minerals | SPS          | MFFTT730030 | 2     | 2     | 4    | E          | Dr. Kristály Ferenc      |
| 3   | Applied environmental geology    | SPS          | MFFAT730032 | 2     | 2     | 4    | E          | Dr. Má dai Viktor        |
| 3   | Elective course I.               | EL           |             | 2     | 2     | 4    | E          |                          |
| 3   | Elective course II.              | EL           |             | 1     | 1     | 2    | P          |                          |

### Graduation requirements:

- Students must have completed all the core, specialization and elective course requirements.
- Students must have achieved a minimum of 180 credits.
- Students will have successfully completed the mandatory internship.
- Students will have submitted a Thesis Work.
  - Students will have fulfilled all administrative and financial requirements towards the university.
- Graduation comprises two parts: the defend of the Thesis Work and passing final exams.
- The final exam is an oral exam, discussing the the following topics:
  - on the Geological engineering module:
    - Geological and geophysical interpretation and prospecting (A1)
    - Geology (A2)
    - Mineral deposits (A3)
  - on the Geophysical engineering module:
    - Geological and geophysical interpretation and prospecting (A1)
    - Geophysics (A2)
    - One topic from the elective subjects (A3)

The overall result of the final examination (ZV) is calculated as:

$$ZV=(A1+A2+A3+3\times D) / 6$$

where:

- D = the final grade of the Thesis work, defined by the examination board,

- A1, A2 and A3 = grades of the three exams.
- Grades are integer numbers and given on a scale from 5 (the highest grade) to 1 the lowest grade). The lowest passing grade is 2.