| 1. | **Field of study** | **Materials Science and Engineering** |
|---|---|---|
| 2. | Academic year of entry | 2017/2018 (winter term) |
| 3. | Level of qualifications/degree | first-cycle studies (in engineering) |
| 4. | Degree profile | general academic |
| 5. | Mode of study | full-time |

## Module: Programming languages

**Module code:** IM1A_JP

**1. Number of the ECTS credits:** 3

**2. Learning outcomes of the module**

| code | description | learning outcomes of the programme | level of competence (scale 1-5) |
|---|---|---|---|
| IM1A_JP_1 | Students have structured knowledge about programming methodology and techniques; know at least one higher-order programming language necessary to simulate phenomena and processes occurring in engineering materials. Students know basic structures and statements in a selected programming language as well can read the program code in the selected programming language. | IM1A_W20 | 5 |
| IM1A_JP_2 | Students have the skill of practical application of the program code in a selected higher-order programming language and of developing simple numerical programs to be used in materials engineering. | IM1A_U04<br>IM1A_U07 | 2<br>5 |
| IM1A_JP_3 | Students are aware of the role of IT achievements change motivating to continuous learning. Students have the skill of creative thinking. . | IM1A_K01<br>IM1A_K05 | 3<br>3 |

**3. Module description**

| | |
|---|---|
| **Description** | The Programming languages module shall enable students gaining knowledge about types of programming languages and their role in creating the computer software, learning the structure of programming languages using the example of Pascal language and familiarising with an integrated programming environment using the example of Delphi programming platform. Students shall acquire the skill of practical use of the gained knowledge consisting in understanding the program code in a selected programming language and in developing simple numerical programs. |
| **Prerequisites** | It is required to achieve effects of education of mathematics and IT modules. |

**4. Assessment of the learning outcomes of the module**

| code | type | description | learning outcomes of the module |
|---|---|---|---|
| IM1A_JP _w_1 | Written examination | Verification of the knowledge based on the lectures content, recommended literature and attended classes. | IM1A_JP_1, IM1A_JP_2, IM1A_JP_3 |
| IM1A_JP _w_2 | Written test | Checking the acquired skill of creating block diagrams for the set algorithms. | IM1A_JP_1, IM1A_JP_2 |
| IM1A_JP _w_3 | Practical test | Checking the skill of creating the program code based on the set block diagram. | IM1A_JP_1, IM1A_JP_2 |
| IM1A_JP _w_4 | Report | A design of a simple numerical program together with the description of its work and operation. | IM1A_JP_1, IM1A_JP_2 |

**5. Forms of teaching**

| code | form of teaching | | | required hours of student's own work | | assessment of the learning outcomes of the module |
|---|---|---|---|---|---|---|
| | type | description (including teaching methods) | number of hours | description | number of hours | |
| IM1A_JP _fs_1 | lecture | The lecture shall enable understanding the issues related to the role and types of programming languages. Typical structure and elements of those languages. Learning the technique of program development - from a problem via the block diagram to the code. The lecture is delivered with the use of audiovisuals, using directly the programming environment and the MS PowerPoint computer presentations. | 30 | The work with the recommended literature comprising independent acquisition of knowledge related to basic issues. | 30 | IM1A_JP _w_1 |
| IM1A_JP _fs_2 | laboratory classes | Practical creation of program flowcharts, coding those flowcharts, compilation and running programs. Exercises are performed by students individually on a common subject or on separate subjects for each student, using the computer laboratories equipment. | 30 | Individual development of simple programs on the hardware made available by the University or on private hardware. Preparation of a numerical problem description, its diagram and preparing comments to the developed program. | 20 | IM1A_JP _w_2, IM1A_JP _w_3, IM1A_JP _w_4 |