

## **EXPLANATORY NOTES**

### **TO THE CURRICULUM OF DOCTORAL PROGRAM “METHODS OF EDUCATION IN ENGINEERING AND TECHNOLOGIES”**

**Professional field: 1.3. Pedagogy of education in...  
Field of higher education: 1. Pedagogical studies**

The Faculty of Engineering at South-West University "Neofit Rilski" Blagoevgrad, and Department of Technical Education and Professional Training, provide the necessary academic environment for the education.

The educational process is planned by an individual education plan and includes lecture and extracurricular employment of PhD students, training and exams, research and pedagogical activity, preliminary defense, and defense of the dissertation before academic jury.

The course of full-time studies and for self-studies is six semesters/three years, and for part-time studies – eight semesters/four years.

The academic, research and educational activities of the doctoral student are distributed by semesters and ensure the achievement of 180/240 credit: 30 credits per semester. Each student studies six compulsory and elective academic subjects. PhD student chooses one extracurricular discipline included in doctoral programs of the Southwest University.

Extramural activity of the PhD students provides research and pedagogical activity and is implemented within the individual activities included in the structure of the curriculum.

The PhD student acquires the right to defend a dissertation after the completion of the educational activities, a successful passing of exams as defined in the individual educational plan and implementation of criteria and indicators, required to evaluate the readiness to be awarded the educational and scientific degree of Doctor.

## **QUALIFICATION STANDARDS**

### **DOCTORAL PROGRAM**

#### **METHODOLOGY OF EDUCATION IN ENGINEERING AND TECHNOLOGIES**

The option to continue their education in the doctoral program “Methodology of Education in Engineering and Technologies” and to be awarded with the PhD degree is offered to students who have completed Master’s degree and have passed successfully the entrance exams.

#### **I. Requirements to professional qualities and competence of PhD students**

- Scientific competence in the sphere of methodology, methods and instrumentation of scientific pedagogical and special research;
- Practical skills for performing regional, national and international pedagogical research and educational forums in the sphere of technological training and vocational education;
- Ability to foreign language communication and exchange of databases in information networks;
- Ability to work in a team and observing the principles of academic and research ethics.

#### **II. Requirements for the preparation of PhD students**

- Independent research in the sphere of the dissertation topic and competence for implementation of the results of their own research in the teaching practice;
- Competence for scientific and teaching practice in universities in the area oriented towards Methodology of Education in Engineering and Technologies and other related areas;
- Competence in managerial and expert activities in the field of secondary and higher education.

**Structure of Doctoral Curriculum  
Methodology of Education  
in Engineering and Technologies - Full-time study**

**Contents of the Curriculum**

| №  | ACADEMIC DISCIPLINES AND ACTIVITIES                                    | Grading  |                     | CREDITS      | In-class activities |            |           |                     | Extramural activities /hours/ |            |
|--|--|----------|---------------------|--------------|---------------------|------------|-----------|---------------------|-------------------------------|------------|
|  |  | Semester | Type of controlling |              | Total               | Lectures   | Seminars  | Practical exercises |                               |            |
| <b>ACADEMIC DISCIPLINES AND ACTIVITIES</b> |  |          |                     |              |                     |            |           |                     |                               |            |
| 1  | Philosophical foundation of pedagogy                                   | I        | exam                | 10,0         | 90                  | 45         | 45        | 0                   | 180                           |            |
| 2  | Specialized Foreign Language (Bulgarian for foreigners)                | I        | exam                | 10,0         | 90                  | 45         | 45        | 0                   | 180                           |            |
| 3  | Development and presentation of scientific thesis                      | I        | Defense             | 10,0         | 0                   | 0          | 0         | 0                   | 360                           |            |
|  |  |          |                     | <b>TOTAL</b> | <b>30</b>           | <b>180</b> | <b>90</b> | <b>90</b>           | <b>0</b>                      | <b>720</b> |
| <b>ACADEMIC DISCIPLINES AND ACTIVITIES</b> |  |          |                     |              |                     |            |           |                     |                               |            |
| 1  | Project Development and Management                                     | II       | exam                | 6,0          | 60                  | 30         | 15        | 15                  | 120                           |            |
| 2  | Methodology and methods of pedagogical research                        | II       | exam                | 6,0          | 60                  | 15         | 0         | 45                  | 120                           |            |
| 3  | Elective academic discipline   | II       | exam                | 6,0          | 60                  | 30         | 30        | 0                   | 120                           |            |
| 4  | Discussion on the doctoral thesis project - I stage                    | II       | Defense             | 12,0         | 0                   | 0          | 0         | 0                   | 360                           |            |
|  |  |          |                     | <b>TOTAL</b> | <b>30</b>           | <b>180</b> | <b>75</b> | <b>45</b>           | <b>60</b>                     | <b>720</b> |
| <b>ACADEMIC DISCIPLINES AND ACTIVITIES</b> |  |          |                     |              |                     |            |           |                     |                               |            |
| 1  | Elective academic discipline   | III      | exam                | 6,0          | 60                  | 30         | 30        | 0                   | 120                           |            |
| 2  | Extracurricular academic discipline                                    | III      | exam                | 6,0          | 60                  | 30         | 30        | 0                   | 120                           |            |
| 3  | Discussion on the doctoral thesis project - II stage                   | III      | Defense             | 12,0         | 0                   | 0          | 0         | 0                   | 360                           |            |
| 4  | Pedagogical activities - leading seminars and extracurricular programs | III      | Discussion          | 6,0          | 0                   | 0          | 0         | 0                   | 180                           |            |
|  |  |          |                     | <b>TOTAL</b> | <b>30,0</b>         | <b>120</b> | <b>60</b> | <b>60</b>           | <b>0</b>                      | <b>780</b> |

| <b>RESEARCH AND TEACHING ACTIVITIES</b>       |   |    |            |             |          |          |          |          |            |
|---|---|----|------------|-------------|----------|----------|----------|----------|------------|
| 1   | Discussion on scientific research in regards with dissertation  | IV | Defense    | 12,0        | 0        | 0        | 0        | 0        | 360        |
| 2   | Pedagogical activities - leading seminars and extracurricular programs  | IV | Discussion | 9,0         | 0        | 0        | 0        | 0        | 270        |
| 3   | Research - preparation and publication of articles, studies and scientific research projects. Participation in research projects. | IV | Discussion | 9,0         | 0        | 0        | 0        | 0        | 270        |
| <b>TOTAL</b>                                  |   |    |            | <b>30,0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>900</b> |
| <b>PRELIMINARY DISCUSSION ON DISSERTATION</b> |   |    |            |             |          |          |          |          |            |
| 1   | Introduction to procedures for dissertation defense before jury. Preparation for defense.   | V  |            | 10,0        | 0        | 0        | 0        | 0        | 150        |
| 2   | Discussion of dissertation  | V  | Defense    | 20,0        | 0        | 0        | 0        | 0        | 750        |
| <b>TOTAL</b>                                  |   |    |            | <b>30,0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>900</b> |
| 1   | Completion of dissertation. Preparation for preliminary discussion of dissertation.Preliminary discussion.                        | VI | Defense    | 30,0        | 0        | 0        | 0        | 0        | 900        |
| <b>TOTAL</b>                                  |   |    |            | <b>30,0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>900</b> |

### **TOTAL FOR THE COURSE OF STUDIES**

Compulsory academic disciplines: 4 with total of 300 contact hours

Elective academic disciplines: 2 with total of 200 contact hours

Extracurricular academic disciplines: 60 contact hours

**Total number in-class contact hours**

**480**

**Total number extracurricular contact hours**

**4920**

**5400**

### **Research and pedagogical activity of the PhD student: 130 credits**

The credits for research and pedagogical activities are awarded after a successful defense of a thesis which form is determined by the mentor and coordinated with the individual learning plan of the PhD student.

**Total number of credits for I - IV semester of education - 180 credits**

| <b>STATUS OF ACADEMIC DISCIPLINES</b>   |   |     |      |      |    |    |    |    |     |
|---|---|-----|------|------|----|----|----|----|-----|
| <b>COMPULSORY ACADEMIC DISCIPLINES</b>  |   |     |      |      |    |    |    |    |     |
| 1   | Philosophical foundation of pedagogy  | I   | exam | 10,0 | 90 | 45 | 45 | 0  | 180 |
| 2   | Project Development and Management  | II  | exam | 6,0  | 60 | 30 | 15 | 15 | 120 |
| 3   | Methodology and methods of pedagogical research                                       | II  | exam | 6,0  | 60 | 15 | 0  | 45 | 120 |
| 4   | Specialized Foreign Language (Bulgarian for foreigners)                               | I   | exam | 10,0 | 90 | 45 | 45 | 0  | 180 |
| 5   |   |     |      |      |    |    |    |    |     |
| 6   |   |     |      |      |    |    |    |    |     |
| <b>ELECTIVE ACADEMIC DISCIPLINES - offered to choose</b>  |   |     |      |      |    |    |    |    |     |
| И1  | Contemporary problems of the methodology of education in engineering and technologies | II  | exam | 6,0  | 60 | 30 | 30 | 0  | 120 |
| И2  | Development of technical skills   | II  | exam | 6,0  | 60 | 30 | 30 | 0  | 120 |
| И3  | Technology of vocational training   | II  | exam | 6,0  | 60 | 30 | 30 | 0  | 120 |
| И4  | Psychological and pedagogical measurements in teaching Engineering and Technologies   | III | exam | 6,0  | 60 | 30 | 30 | 0  | 120 |
| И5  | Training in Engineering and Technologies for children with special needs              | III | exam | 6,0  | 60 | 30 | 30 | 0  | 120 |
| <p>Elective courses are offered after formulating the topic of scientific and pedagogical research, included in the individual curriculum plan of the PhD student and approved by the academic unit. The PhD student chooses 2 academic disciplines.</p>  |   |     |      |      |    |    |    |    |     |
| <b>EXTRACURRICULAR ACADEMIC DISCIPLINES</b>   |   |     |      |      |    |    |    |    |     |
| <p>The PhD student in the doctorla program "Methodology of Education in Engineering and Technologies" may extracurricularly study any discipline, taught in the doctoral programs of the Southwest University regardless of the department that organizes the education of the theme of the dissertation.</p> |   |     |      |      |    |    |    |    |     |