Faculty of Fundamental Problems of Technology

COURSE CARD

| | | |
|---|---|---|
| Name in polish | : | **Programowanie Deklaratywne** |
| Name in english | : | **Declarative Programming** |
| Field of study | : | Computer Science |
| Specialty (if applicable) | : | |
| Undergraduate degree and form of | : | masters, stationary |
| Type of course | : | optional |
| Course code | : | E2_W11 |
| Group rate | : | Yes |

| | Lectures | Exercides | Laboratory | Project | Seminar |
|---|---|---|---|---|---|
| Number of classes held in schools (ZZU) | 30 | 30 | | | |
| The total number of hours of student workload (CNPS) | 90 | 90 | | | |
| Assesment | pass | | | | |
| For a group of courses final course mark | X | | | | |
| Number of ECTS credits | 3 | 3 | | | |
| including the number of points corresponding to the classes of practical (P) | | 3 | | | |
| including the number of points corresponding occupations requiring direct contact (BK) | 3 | 3 | | | |

PREREQUISITES FOR KNOWLEDGE, SKILLS AND OTHER POWERS

The prerequisites are not defined for this module.

COURSE OBJECTIVES

**C1** Getting to know the theoretical foundations of logic programming

**C2** Learning to use the methods of automatic theorem proving

COURSE LEARNING OUTCOMES

The scope of the student's knowledge:

**W1** Student knows the issue of unification termów

**W2** Student knows the issues related to the interpretation of first-order logic formulas

**W3** Student knows the automated theorem proving methods based on the principle of resolution

The student skills:

**U1** Student is able to apply the resolution to automatic theorem proving

**U2** Student is able to apply the control strategies used to increase the efficiency of inference

**U3** Student is able to use Prolog as a practical programming system based on the resolution

The student's social competence:

**K1** Student is able to indicate the applications of automated theorem proving in various fields

| COURSE CONTENT | | |
|---|---|---|
| Type of classes - lectures | | |
| Wy1 | Terms and cyclic terms | 2h |
| Wy2 | Matching and unification | 2h |
| Wy3 | Semiunification | 2h |
| Wy4 | Interpretations of formulas in first order logic | 2h |
| Wy5 | Normal forms and Skolem standard forms | 2h |
| Wy6 | Herbrand procedure | 2h |
| Wy7 | The resolution principle | 2h |
| Wy8 | Semantic resolution | 2h |
| Wy9 | Lock resolution | 2h |
| Wy10 | Linear resolution | 2h |
| Wy11 | Control strategies | 2h |
| Wy12 | The equality relation | 2h |
| Wy13 | SLD(NF)-resolution | 2h |
| Wy14 | The least Herbrand model | 2h |
| Wy15 | Conclusions | 2h |
| Type of classes - exercises | | |
| Ćw1 | Terms | 2h |
| Ćw2 | Unification | 4h |
| Ćw3 | Interpretation | 4h |
| Ćw4 | Skolem normal form and Herbrand procedure | 4h |
| Ćw5 | Resolution | 4h |
| Ćw6 | Linear rezolution | 4h |
| Ćw7 | Control strategies | 4h |
| Ćw8 | SLD(NF)-resolution and its semantics | 4h |

| Applied learning tools |
|---|
| 1. Traditional lecture<br>2. Multimedia lecture<br>3. Solving tasks and problems<br>4. Consultation<br>5. Self-study students |

| EVALUATION OF THE EFFECTS OF EDUCATION ACHIEVEMENTS | | |
|---|---|---|
| Value | Number of training effect | Way to evaluate the effect of education |
| F1 | W1-W3, K1-K1 | Test |
| F2 | U1-U3, K1-K1 | Realization of exercises |
| P=60%*F1+40%*F2 | | |

| BASIC AND ADDITIONAL READING |
| --- |
| 1. C.L. Chang, R.C.T. Lee. Symbolic Logic and Mechanical Theorem Proving. Academic Press, Inc., 1973.<br>2. J.W. Lloyd. Foundations of logic programming. Springer-Verlag New York, 1987.<br>3. M. Wójcik. Zasada rezolucji. Metoda automatycznego wnioskowania. PWN, 1991. |
| SUPERVISOR OF COURSE |
| dr Przemysław Kobylański |

RELATIONSHIP MATRIX EFFECTS OF EDUCATION FOR THE COURSE
Declarative Programming
WITH EFFECTS OF EDUCATION ON THE DIRECTION OF COMPUTER SCIENCE

| Course training effect | Reference to the effect of the learning outcomes defined for the field of study and specialization (if applicable) | Objectives of the course** | The contents of the course** | Number of teaching tools** |
|---|---|---|---|---|
| W1 | K2_W02 | C1 | Wy1-Wy15 | 1 2 4 5 |
| W2 | K2_W02 | C1 | Wy1-Wy15 | 1 2 4 5 |
| W3 | K2_W02 | C1 | Wy1-Wy15 | 1 2 4 5 |
| U1 | K2_U12 | C2 | Ćw1-Ćw8 | 3 4 5 |
| U2 | K2_U12 | C2 | Ćw1-Ćw8 | 3 4 5 |
| U3 | K2_U12 | C2 | Ćw1-Ćw8 | 3 4 5 |
| K1 | K2_K14 | C1 C2 | Wy1-Wy15 Ćw1-Ćw8 | 1 2 3 4 5 |