

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Discrete mathematics | | Code 1010331521010342739 |
| Field of study Information Engineering | Profile of study (general academic, practical) (brak) | Year /Semester 1 / 2 |
| Elective path/specialty - | Subject offered in: Polish | Course (compulsory, elective) obligatory |
| Cycle of study: First-cycle studies | Form of study (full-time, part-time) full-time | |
| No. of hours Lecture: 30 Classes: 30 Laboratory: - Project/seminars: - | | No. of credits 6 |
| Status of the course in the study program (Basic, major, other) (brak) | | (university-wide, from another field) (brak) |
| Education areas and fields of science and art the sciences Mathematical sciences | | ECTS distribution (number and %) 6 100% 6 100% |
| Responsible for subject / lecturer: prof. dr hab. Ryszard Płuciennik email: ryszard.pluciennik@put.poznan.pl tel. 61 665 33 20 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań | | Responsible for subject / lecturer: dr Zenon Zbąszyniak email: zenon.zbaszyniak@put.poznan.pl tel. 61 665 27 12 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Basic mathematical knowledge from secondary school. |
| 2 | Skills | The student is able to prepare short presentation devoted to results of an engineering tasks. |
| 3 | Social competencies | The student understands the necessity of self-education (master study, PhD study, postgraduate studies) to improve the linguistic, professional and social skills. |
| Assumptions and objectives of the course: The skill of interpretation of problems occurring in computer science into language of functions and relations. The skill of application to solving problems in computer science by using mathematical logic methods, technics of proving theorems, graph theory and recurrence. | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: 1. The student has the basic knowledge in mathematics containing algebra, calculus, mathematical logic, probability theory, elements of discrete and applied mathematics. - [K_W01] 2. The student has a structured and theoretically supported knowledge in basic algorithms, technics of construction of algorithms, abstract structures of data and their implementation. - [K_W04] | | |
| Skills: 1. The student is able work individually and in a group. He is able to estimate the time that is necessary for realisation of deputed problem. He is able to work out and to realise a schedule ensuring of meeting the dethline. - [K_U02] 2. The student is aware of the necessity of self-education in order to improve professional skills. - [K_U05] 3. The student is able to use information from references, data bases and other sources. He can interpret them, to draw conclusions and to formulate and validate opinions. em. - [K_U01] | | |
| Social competencies: 1. The student is aware of an importance of professional behavior, compliancing with the rules of professional ethics and respect of diversity ideas and cultures. - [K_K03] 2. The student is aware of responsibility for unassisted work and readiness to submit to rules in teamwork and to take responsibility for collaboration. - [K_K04] | | |

| Assessment methods of study outcomes | | |
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| <p>Lecture Valuation of knowledge and skills during oral and written exam.</p> <p>Practical Lessons Two large tests concerning an application of knowledge from the lectures in exercises (student can use his own notes) Systematic control of theoretical knowledge in form of short quizzes. Valuation of student answers during lessons. Valuation of activity during lessons.</p> | | |
| Course description | | |
| <p>Revision 2017</p> <p>Applied methods of education: lectures and practical lessons. Interactive lectures with problems and questions for students. The activity of students is taken into account in valuation of them. Discussion during lectures is expected. Connections with others mathematical subjects are indicated.</p> <p>Practical lessons. Solving of exemplary exercises on a blackboard. Discussion of solutions with relative comments.</p> <p>Elements of mathematical logic. Calculus of sentences. Tautologies. Sets, relations, sequences and functions in turn of discrete mathematics. Methods of proving theorems. Mathematical induction principle. Landau notation. Recurrence definitions and recurrence relations. Euclides algorithm. Fundamental counting problems. Combinatorics. Inclusion-exclusion principle. Binomial method. Directed and undirected graphs. Trees. An application of matrices to the description of graphs and relations. Representing graphs and graphs principle. Shortest path problems. Problems requiring of the theory of Latin squares. Rook polynomials and their applications. Course illustrated by many examples and counterexamples.</p> | | |
| <p>Basic bibliography:</p> <p>1. R. L. Graham, D. E. Knuth, O. Patashnik, <i>Matematyka konkretna</i>, PWN, Warszawa 2002. 2. K.A. Ross, C.R.B. Wright, <i>Matematyka dyskretna</i>, PWN, Warszawa 2003.</p> | | |
| <p>Additional bibliography:</p> <p>1. T.H. Cormen, C.E. Leiserson, R.L. Rivest, <i>Wprowadzenie do algorytmów</i>, PWN, Warszawa 2002.</p> | | |
| Result of average student's workload | | |
| Activity | Time (working hours) | |
| 1. Taking part in lectures | 30 | |
| 2. Taking part in practical lessons | 30 | |
| 3. Preparing for practical lessons | 30 | |
| 4. Preparing for tests | 25 | |
| 5. Preparing for the exam and taking part in it | 25 | |
| Student's workload | | |
| Source of workload | hours | ECTS |
| Total workload | 140 | 6 |
| Contact hours | 30 | 3 |
| Practical activities | 30 | 3 |