### Field of study
Computer Science

### Degree level and programme type
Engineer's degree full-time programme

### Specialization/ diploma path
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### Course name
Discrete Mathematics

### Course code
FCS-00054

### Course type
obligatory

<table>
<thead>
<tr>
<th>Forms and number of hours of tuition</th>
<th>L</th>
<th>C</th>
<th>LC</th>
<th>P</th>
<th>SW</th>
<th>FW</th>
<th>S</th>
<th>Semester</th>
<th>No. of ECTS credits</th>
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### Entry requirements

### Course objectives
The main goal is to familiarize students with basic notions, theorems and methods of combinatorics and graph theory which are the base of mathematical models and algorithms having applications in computer science.

### Course content

#### Lecture

#### Classes
- Induction and recursion
- Arithmetic of integers
- Modular arithmetics,
- Permutation, combination, variation,
- Graph theory problems: Euler and Hamilton graph, connected graph, planar graph, colouring of graphs

### Teaching methods
informative lecture, lecture problem, subject exercises,

### Assessment method
Evaluation of lectures on a base of written examination, evaluation of classes on a base of the written test of solving problems and on evaluation of activity.

### Symbol of learning outcome

#### LO1
knows the basic notions of combinatorics and graph theory and their properties and can illustrate them by examples

#### LO2
knows and understand most of theorems, understands ideas of their proofs and can apply them in solving problems

#### LO3
can describe properties of combinatorial objects and graphs, explain relations between them using learned theorems, methods and techniques

#### LO4
can notice presence and a role of notions of discrete mathematics i applications, mainly in computer science, can demonstrate examples of a practical use of these notions

### Methods of assessing the learning outcomes

#### LO1
written examination, tests of solving problems

#### LO2
written examination, test of solving problems

#### LO3
test of solving problems

#### LO4
test of solving problems

### Student workload (in hours)

#### Calculation
1. Attendance at lectures - 30
2. Preparation for classes - 15
3. Attendance at classes - 30
4. Participation in student-teacher sessions - 20
5. Preparation for the exam - 25
6. Presence during the exam - 2
7. Preparation for tests - 28

TOTAL: 150

### Quantitative indicators

#### Student workload - activities that require direct teacher participation

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. of hours</th>
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<tbody>
<tr>
<td>Attendance at lectures</td>
<td>30</td>
</tr>
<tr>
<td>Preparation for classes</td>
<td>15</td>
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<td>30</td>
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<tr>
<td>Preparation for the exam</td>
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</tr>
<tr>
<td>Presence during the exam</td>
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<tr>
<td>Preparation for tests</td>
<td>28</td>
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</table>

#### Student workload - practical activities

<table>
<thead>
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TOTAL: 150

### No. of ECTS credits

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<tr>
<td>Preparation for classes</td>
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</tr>
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#### Basic references

#### Supplementary references

#### Organisational unit conducting the course
Department of Theoretical Computer Science

#### Author of the programme
dr Joanna Karbowska-Chilińska

#### Date of issuing the programme
Feb. 17, 2022

L - lecture, C - classes, LC - laboratory classes, P - project, SW - specialization workshop, FW - field work, S - seminar