Subject programme

1. Subject name / subject module: **Object-Oriented Programming**
2. Lecture language: **English**

3. **The location of the subject in study plans:**

   - Area or areas of the studies: Computer Engineering and Mechatronics
   - Degree of the studies: **1ˢᵗ degree studies**
     - Field or fields (implementation of effects standard): **Mechatronics**

4. Supervision of subject implementation:
     - The Institute / Another unit: **Institute of Informatics and Mechatronics**
   - The person responsible for the subject: **Uniszkiewicz Cezary, mgr**
   - People cooperating in the development of the programme of the subject:

5. The number of hours and forms of teaching for individual study system and the evaluation method

<table>
<tr><td colspan="21" align="center">Teaching activities with the tutor</td><td rowspan="2">Total</td></tr>
<tr><td rowspan="2">Mode of study</td><td colspan="20" align="center">Form of classes</td></tr>
<tr><td>SOW</td><td>ECTS</td><td>Laboratory work</td><td>SOW</td><td>ECTS</td><td>...</td><td>SOW</td><td>ECTS</td><td>...</td><td>SOW</td><td>ECTS</td><td>...</td><td>SOW</td><td>ECTS</td><td>...</td><td>SOW</td><td>ECTS</td><td>...</td><td>SOW</td><td>ECTS</td><td>ECTS</td></tr>
<tr><td>Full-time studies</td><td></td><td></td><td>38</td><td>50</td><td rowspan="2">3,5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="2">3,5</td></tr>
<tr><td>Part-time studies</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Credit rigor</td><td>...</td><td></td><td colspan="3">graded assignment</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

6. Student workload – ECTS credits balance

   1 ECTS credit corresponds to 25-30 hours of student work needed to achieve the expected learning outcomes including the student's own work

Activity (please specify relevant work for the subject)	Hourly student workload (full-time studies/part-time studies)
Participation in laboratory classes	**38**
Preparation to the practical tests	**48**
Participation in an exam / graded assignment / final grading	**2**
Total student workload (TSW)	**88**
ECTS credits	**3,5**
* Student's workload related to practical forms	**88**
Student's workload in classes requiring direct participation of academic teachers	**38**

7. Implementation notes: recommended duration (semesters), recommended admission requirements, relations between the forms of classes:

   Programming

   Recommended duration of the subject is taken from the course plan.

8. Specific learning outcomes – knowledge, skills and social competence

<table>
<tr><td colspan="2" align="center">Specific learning outcomes for the subject</td><td rowspan="2">Form</td><td rowspan="2">Teaching method</td><td rowspan="2">Methods for testing of (checking, assessing) learning outcomes</td></tr>
<tr><td>Outcome symbol</td><td>Outcome description</td></tr>
<tr><td colspan="5" align="center">Knowledge</td></tr>
<tr><td>K_W04</td><td>Student has advanced knowledge in the field of technical informatics especially in the field object-oriented programming in C#, necessary to understand at an advanced level the complex dependencies of mechatronic systems and to apply this knowledge in pra</td><td rowspan="3">Laboratory work</td><td>inquiry methods</td><td>Activity during classes, practical test</td></tr>
<tr><td>K_W06</td><td>Student knows and understands basics issues in the field of technical computer science related to object-oriented programming in C# language, as well as practical applications of this knowledge.</td><td></td><td></td></tr>
<tr><td>K_W10</td><td>Student has detailed knowledge related to the application of the following in mechatronics: methodology of object-oriented programming.</td><td></td><td></td></tr>
<tr><td colspan="5" align="center">Skills</td></tr>
<tr><td>K_U02</td><td>Student is able to use their object-oriented programming knowledge to formulate and solve problems and perform tasks typical for</td><td>Laboratory work</td><td>inquiry methods</td><td>Activity during classes, practical tests</td></tr>
</table>

	professional activity in the mechatronics industry.			
K_U05	Student has sufficient skills to use the norms and standards appropriate for software design.			
K_U15	Student is able to assess the suitability and choose the appropriate methods and tools to solve a simple object-oriented programming task in the field of Mechatronics.			

9. Assessment rules / criteria for each form of education and individual grades

0% - 50%	ndst	81% - 90%	db
51% - 70%	dst	91% - 93%	db+
71% - 80%	dst+	94% - 100%	bdb

Activity	Grades	Calculation	To Final
Practical test 1	bdb (5)	5*50%	2,5
Practical test 2	bdb (5)	5*50%	2,5
Final result			5

10. The learning contents with the form of the class activities on which they are carried out

(Laboratory work)

1. Introduction to object-oriented programming;

2. Classes (static members, static classes, Reference Types);

3. Members of classes ;

4. Interfaces;

5. Inheritance;

6. Method overloading ;

7. Virtual methods;

8. Abstract classes and methods;

9. Object Lifetime;

10. Exceptions;

11. Delegates;

12. Lambdas

11. Required teaching aids

Laboratory classes - specialist laboratory

12. Literature:
  a. Basic literature:
    Microsoft Visual C#. Step by step., Sharp John, Redmond, 2015
  a. Supplementary literature:
    Beginning C# 2008, Christian Gross, New York, 2007
  b. Internet sources:

    https://docs.microsoft.com/

13. Available educational materials divided into forms of class activities (Author's compilation of didactic materials, e-learning materials, etc.)

14. Teachers implementing particular forms of education

Form of education	Name and surname
1. Laboratory classes	Uniszkiewicz Cezary, mgr