Subject programme

1. Subject name / subject module: **Advanced Programming Techniques (java or c #)**
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: **Skiba Grzegorz, mgr inż.**
   - 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:

Teaching activities with the tutor																						
Mode of study	Form of classes																					Total
	...	SOW	ECTS	Laboratory work	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	...	SOW	ECTS	ECTS
Full-time studies				22	28	2																2
Part-time studies																						
Credit rigor				Graded assignment																		

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 lectures	-
Participation in laboratory classes	22
Preparation to laboratory classes	10
Preparation of final project	6
Independent study of the subject	6
Participation in an exam / graded assignment	2
Total student workload (TSW)	50
ECTS credits	2
* Student's workload related to trainings	50
Student's workload in classes requiring direct participation of academic teachers	22

7. Implementation notes: recommended duration (semesters), recommended admission requirements, relations between the forms of classes:
   - Recommended admission requirements – none.
   - Recommended duration of the subject is taken from the course plan.
8. Specific learning outcomes – knowledge, skills and social competence:

Specific learning outcomes for the subject		**Form**	**Teaching method**	**Methods for testing of (checking, assessing) learning outcomes**
Outcome symbol	**Outcome description**			
Knowledge				
K_W04	**A student has basic knowledge in the field of technical informatics and telecommunications, necessary to understand at an advanced level the complex dependencies of mechatronic systems that contain database systems and to apply this knowledge in practice th**	**Laboratory work**	**Inquiry methods**	**Student learning activities**
K_W06	**A student knows and understands selected specific issues of object-oriented programming in C# language as well as practical applications of this knowledge.**			
K_W10	**A student has detailed knowledge of object-oriented programming in Java or C# language, databases for .NET applications using Entity framework and security issues related to database applications.**			
Skills				
K_U02	**A student is able to use their knowledge to formulate and solve problems related to database applications that may occur in a professional activity environment.**	**Laboratory work**	**Inquiry methods**	**Student learning activities**

K_U05	A student has programming and database management experience and skills to use the norms and standards applicable in the mechatronics industry.			
K_U15	A student is able to select an appropriate programming environment, database technology and components to solve an engineering task that might occur in the field of Mechatronics.			

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

0% - 50%	ndst	**80% - 86%**	db
51% - 70%	dst	**91% - 93%**	db+
71% - 79%	dst+	**94% - 100%**	bdb

Activity	Grades	Calculation	To Final
Tasks done during laboratory classes	dst, db, bdb, db (3,4,5,4)	arithmetic mean (2,5,3,4)* 20%	0,8
Attendance	on 80% of all classes	80% * 5 -> 3,5 * 10%	0,4
Final project	bdb (5)	5 * 70%	3,5
Final result			4,7
Grade		4,7/5 = 94%	**Db+ (4.5)**

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

(Laboratory work)

1. Interfaces;
2. Virtual methods;
3. Delegates;
4. Anonymous methods;
5. Lambda expressions;
6. LINQ queries;
7. Data Base in programming;
8. Entity Framework;
9. WPF;
10. Exercises;
11. Troubleshooting.

11. Required teaching aids:

a. Lecture - multimedia projector.

b. Laboratory classes - specialist laboratory.

c. Exercises - a room adapted for conducting classes in the form of exercises / workshops, multimedia projector.

12. Literature:

a. Basic literature:

Troelsen A., Japikse P.: C# 6.0 and the .NET 4.6. Framework, Apress, New York, 2015

Bipin J.: Beginning XML with C# 7, Apress, Berkeley, 2017

b. Supplementary literature:

Sharp J.: Microsoft Visual C#. Step by step., Microsoft Press, Redmond, 2015

Rouleau D. J.: Beginning Entity Framework Core 2.0, Apress, Berkeley, 2018

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. Lecture	
2. Laboratory classes	Pałczyński Marek, mgr inż. Skiba Grzegorz, mgr inż. Uniszkiewicz Cezary, mgr
3. Training	
4. Project classes	
5. Workshop classes	
6. Simulation game	
7. Language classes	