Polish course name	**PROJEKTOWANIE ZABEZPIECZEŃ ANTYKOROZYJNYCH**
English course name	**ANTI-CORROSION PROTECTIVE DESIGN**
Course code	**WIP-MDL-D1-ACPD-07**
Field of study	**Materials design and logistics**
Level of qualification	**First degree**
Form of study	**Full-time**
Semester	**7**
Number of ECTS points	**2**
Ways of assessment	**Test**

Number of hours per semester

Lecture	Seminar	Classes	Laboratory	Project
15			15	

TEACHERS:

Dr inż. Karina Jagielska-Wiaderek,
Dr Edyta Owczarek,
Dr hab. Krystyna Giza, prof. PCz.

COURSE OBJECTIVES:

- **C1** Providing students with knowledge in the field of designing anti-corrosion protection and painting systems.
- **C2** Acquisition by students of the ability to work with standards in the field of anti-corrosion protection.

PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES:

1. Basic knowledge of chemistry, mathematics and electrical engineering.
2. Ability to work independently and in a group.
3. Ability to use literature sources and internet resources.

COURSE CONTENT

LECTURE

- **L1** Design process: function, material, shape and manufacturing method.
- **L2, L3** Basics of corrosion phenomena. Types of corrosion damage and their effects.
- **L4** Electrochemical corrosion: mechanism and prevention.
- **L5, L6** Requirements for: proper design of the structure, environmental protection, corrosion protection contractor.
- **L7** Protective properties of varnish products.
- **L8** Coating systems for steel structures.
- **L9, L10** Influence of surface contamination on the quality of coatings. Ways of surface preparation.
- **L11** Anti-corrosion protection technologies.
- **L12, L13** Standards related to anti-corrosion protection.
- **L14** Defects of paints and anti-corrosion coatings, standardisation in the assessment of degradation of coatings.
- **L15** Protection of steel-concrete connections.

LABORATORY

- **Lab1, Lab2** To acquaint students with the rules of passing the subject and the rules of occupational health and safety in the laboratory. Construction of the areological system.
- **Lab3, Lab4** Methods of surface preparation for protective coatings.
- **Lab5, Lab6** Protective properties of varnish products.
- **Lab7, Lab8** Anti-corrosion layers after various forming techniques.
- **Lab9, Lab10** Examination of geometrical parameters and tribological properties of protective layers.
- **Lab11, Lab12** Defects of paints and coatings, destruction of coatings.
- **Lab13 - Lab15** Modification of the surface of products in industrial practice - field trips.

BASIC REFERENCES

1. H. Bala, Korozja Materiałów – Teoria i Praktyka, Wydawnictwo WIPMiFS, Częstochowa.
2. J. Baszkiewicz, M. Kamiński, Podstawy Korozji materiałów, Ofic. Wyd. PW, Warszawa 2006 r.

3. Przewodnik po ochronie przeciwkorozyjnej powierzchni stalowych – TEKNOS.
4. A. Chmielewski - Zabezpieczenie przeciwkorozyjne konstrukcji stalowych, Wrocław 1997 r.

SUPPLEMENTARY REFERENCE MATERIALS

1. K. Jagielska-Wiaderek, Głębokościowa charakterystyka odporności korozyjnej azotowanego stopu Ti6Al4V, Ochrona przed Korozją, Vol.64, nr 2, 34-37 (2021).
2. Norma PN-EN-ISO-12944.

LEARNING OUTCOMES

› **EU1** The student has theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this area.
› **EU2** The student knows the general principles of selecting paint systems for steel structures.
› **EU3** The student is able to carry out appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a test report.

TEACHING TOOLS

› Multimedia presentations.
› Manuals, scripts.
› Laboratory equipment and guides.

WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

› **F1**. Assessment of the preparation of laboratory reports.
› **F2**. Assessment of the mastery of the teaching material being the subject of laboratory exercises - final colloquium.
› **P1**. Assessment of the mastery of the teaching material within the lectures - final colloquium.

STUDENT WORKLOAD

Form of activity	Number of hours	ECTS
Contact hours with the teacher		
Lectures	15	0,6
Seminar		
Classes		
Laboratory	15	0,6
Project		
Test	2	0,08
Exam		
Total contact hours	32	1,28
Student's own work		
Getting acquainted with the indicated literature	5	0,2
Preparation for seminar		
Preparation for classes		
Preparation for lab	5	0,2
Project preparation		
Consultation	4	0,16
Preparation for the test	4	0,16
Total student's own work	18	0,72
Total number of hours/ ECTS points for the course	**50**	**2,0**

ADDITIONAL INFORMATION

Timetable of classes	https://wip.pcz.pl/dla-studentow/plan-zajec/studia-stacjonarne
Information about the consultation (time + place)	https://wip.pcz.pl/dla-studentow/konsultacje-dla-studentow

MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program	Course objectives	Course content	Ways of assessment
EU 1	K_W01, K_W04, K_K01,	C1,C2	L1 - L15	P1
EU 2	K_W01, K_W03, K_U03, K_U04, K_K02,	C1,C2	L1 - L15, Lab1 - Lab15	F1, F2, P1
EU 3	K_W03, K_U03, K_K03,	C1,C2	Lab1 - Lab15	F1, F2

FORM OF ASSESSMENT - DETAILS

EU1 The student has theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this area.

- 2,0 The student doesn't have theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this area.
- 3,0 The student has partially theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this area.
- 3,5 The student has almost theoretical knowledge of corrosion and designing anti-corrosion protection, partially knows the terminology of terms and terms in this area.
- 4,0 The student has a good theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this field well.
- 4,5 The student has an almost good theoretical knowledge of corrosion and corrosion protection design, knows the terminology of terms and terms in this field well.
- 5,0 The student has very good theoretical knowledge of corrosion and designing anti-corrosion protection, knows the terminology of terms and terms in this field.

EU2 The student knows the general principles of selecting paint systems for steel structures.

- 2,0 The student doesn't know the general principles of selecting paint systems for steel structures.
- 3,0 The student partially knows the general principles of selecting paint systems for steel structures.
- 3,5 The student almost knows the general principles of selecting paint systems for steel structures.
- 4,0 The student knows the general principles of selecting paint systems for steel structures well.
- 4,5 The student knows the general principles of selecting paint systems for steel structures almost very well.
- 5,0 The student knows the general principles of selecting paint systems for steel structures very well.

EU3 The student is able to carry out appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a test report

- 2,0 The student isn't able to carry out appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a test report.
- 3,0 The student is partially able to carry out appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a test report.
- 3,5 The student is almost able to carry out appropriate tests in order to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a report on the research carried out .
- 4,0 The student is able to carry out appropriate tests in order to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a report on the research carried out well.
- 4,5 The student is able to carry out the appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a report on the tests carried out almost very well.
- 5,0 The student is able to carry out the appropriate tests to determine the effectiveness of anti-corrosion protection, analyse the results and prepare a report on the tests carried out very well.