**3.2. Course description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Generic information** | | | |
| Head of Course | dr.sc. Nikola Tomac | | |
| Course | CORROSION AND PROTECTION OF MATERIALS | | |
| Study Programme | Marine Engineering | | |
| Type of Course | electoral | | |
| Year of Study | 1 |  | |
| Estimated Student Workload and Methods of Instruction | ECTS coefficient of Student Workload | | 4 |
| Number of Hours (L+E+S) | | 2+1+0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. GENERAL COURSE DESCRIPTION** | | | | | | | | |
| *1.1. Course Objectives* | | | | | | | | |
| *The objective of this course is to provide the student with the appropriate corrosion knowledge and protection of materials and systems prescribed by STCW and IMO Model Courses for the service of Naval Navigation Officer.* | | | | | | | | |
| *1.2. Prerequisites for Course Registration* | | | | | | | | |
|  | | | | | | | | |
| *1.3. Expected Learning Outcomes* | | | | | | | | |
| After passing the exam, students will be able to do the following:  1. Define corrosion, abrasion, erosion, mechanical fatigue, cavitation.  2. Explain corrosion of metals.  3. Explain the division of corrosion.  4. Explain electrochemical corrosion.  5. Explain chemical corrosion.  7. Describe the forms and mechanisms of corrosion.  8. Describe the Purbaix diagram.  9. Explain the corrosion of individual technical metals.  10. Explain basic corrosion protection procedures.  12. Know the technological preconditions for good protection.  13. Have the knowledge necessary to prepare the surface and apply different methods of protection.  14. Have the knowledge necessary to perform the application of various corrosion tests and test the effectiveness of protection.  15. Have the knowledge necessary to perform corrosion tests and test the effectiveness of protection.  16. Have the knowledge necessary to perform a safety performance test | | | | | | | | |
| *1.4. Course Outline* | | | | | | | | |
| Metal corrosion.  Corrosion division.  Chemical corrosion and electrochemical corrosion.  Definitions of corrosion, abrasion, erosion, mechanical fatigue and cavitation.  Forms and mechanisms of corrosion.  Corrosion of certain technical metals.  Special forms of corrosion in the sea.  Destruction of inorganic and organic materials.  Corrosion protection.  Technological prerequisites for good protection.  Surface preparation.  Methods of protection.  Cathodic protection.  Corrosion tests. | | | | | | | | |
| 1.5. Modes of  Instruction | | Lectures  Seminars and workshops  Exercises  E-learning  Field work | | | Practical work  Multimedia and Network  Laboratory  Mentorship  Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| *1.6. Comments* | |  | | | | | | |
| *1.7. Student Obligations* | | | | | | | | |
| Regular attendance at classes, regular midterm exams, final exam. | | | | | | | | |
| *1.8. Assessment1 of Learning Outcomes* | | | | | | | | |
| Course attendance | 1,5 | Class participation |  | Seminar paper | |  | Experiment |  |
| Written exam |  | Oral exam | 0,9 | Essay | |  | Research |  |
| Project |  | Continuous Assessment | 1,6 | Presentation | |  | Practical work |  |
| Portfolio |  |  |  |  | |  |  |  |

1 **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam* | | | | |
| *Learning outcomes are evaluated through regular class attendance and activity (10%), continuous exams (60%) and final examination (30%). During the class, the student can collect a maximum of 70% of the grade points as follows:*  *A) Successfully pass 2 oral midterms within the prescribed deadlines. Each passed midterm carries a minimum of 15% and a maximum of 30% of marks and can be taken 3 times. A student who has not achieved all the required learning outcomes cannot take the midterm exam. The next colloquium cannot be accessed unless the previous colloquium is passed. The colloquiums include the following:*  *1st Colloquium (Learning Outcomes 1-5)*  *2nd Colloquium (Learning Outcomes 1-5)*  *B) Active attendance (lectures and exercises). Each class absence accounts for 1% of the grade point.*  *Students who have passed both exams can apply for the oral final exam (learning outcomes 1-5) and earn a minimum of 15% and a maximum of 30% of the marks.*  *Examples of evaluating learning outcomes in relation to set learning outcomes are:*  *1. Explain corrosion of metals.*  *2. Explain the division of corrosion.*  *3. Explain chemical and electrochemical corrosion.*  *4. Explain the corrosion of individual technical metals.*  *5. Explain the special forms of corrosion in the sea.*  *6. Explain the basic corrosion protection procedures.*  *7. Explain basic cathodic protection procedures.*  *8. Describe the basics of corrosion testing and protection effectiveness testing.*  *9. Explain methods of testing the effectiveness of protection.* | | | | |
| *1.10. Main Reading* |  | |  | |
| Tomac, N. Korozija i zaštita materijala, 2012.  Tomac, N. Corrosion and protection of materials, 2019. | | | | |
| *1.11. Recommended Reading* |  | |  | |
| Corrosion and Protection (Engineering Materials and Processes)-Einar Bardal  [Mechanical Engineers Data Handbook20200130 50502 sjtyzf](https://www.academia.edu/41792235) | | | | |
| *1.12. Number of Main Reading Examples* |  | |  | |
| *Title* | *Number of examples* | | *Number of students* | |
| Tomac, N. Corrosion and protection of materials, 2019. | |  | |  |
|  | |  | |  |
|  | |  | |  |
| *1.13. Quality Assurance* | | | | |
| In accordance with ISO 9001 at the Faculty level. | | | | |