**Course description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Generic information** | | | |
| Head of Course | Goran Vukelić | | |
| Course | Application of Numerical Methods in Engineering | | |
| Study Programme | MSc Marine Engineering and Maritime Transport Technology | | |
| Type of Course | elective | | |
| Year of Study | 1 |  | |
| Estimated Student Workload and Methods of Instruction | ECTS coefficient of Student Workload | | 6 |
| Number of Hours (L+E+S) | | 1+2+2 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. GENERAL COURSE DESCRIPTION** | | | | | | | | |
| *1.1. Course Objectives* | | | | | | | | |
| Adoption of theoretical and practical knowledge of numerical structural modelling and strength analysis. | | | | | | | | |
| *1.2. Prerequisites for Course Registration* | | | | | | | | |
| Passed exams from Engineering Mechanics (Strength of Materials). | | | | | | | | |
| *1.3. Expected Learning Outcomes* | | | | | | | | |
| 1. To perform structural numerical modelling.  2. To perform finite element discretization.  3. To determine stress and strain distribution.  4. To apply finite element software for solving structural problems.  5. To interpret, assess and explain the results of numerical analysis. | | | | | | | | |
| *1.4. Course Outline* | | | | | | | | |
| CAE systems. Introduction to the application of numerical methods in solving structural problems. Defining geometry for assigned problem. Mathematical modelling. Defining loads and boundary conditions. Application of finite element method for assigned structural problem. | | | | | | | | |
| *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* | | | | | | | | |
| Attending the classes, fulfilling the assignments. | | | | | | | | |
| *1.8. Assessment1 of Learning Outcomes* | | | | | | | | |
| Course attendance | 2.5 | Class participation | 0.5 | Seminar paper | | 2 | Experiment |  |
| Written exam | 1 | Oral exam |  | Essay | |  | Research |  |
| Project |  | Continuous Assessment |  | Presentation | |  | Practical work |  |
| Portfolio |  |  |  |  | |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam* | | | | |
| * Continuous assessment during semester (70% of learning outcomes)   + seminar paper (learning outcome 1-4) * Final exam (30% of learning outcomes 4,5) | | | | |
| *1.10. Main Reading* |  | |  | |
| Klaus-Jurgen Bathe: Finite Element Procedures, 2nd Ed., Bathe, Watertown, 2014 | | | | |
| *1.11. Recommended Reading* |  | |  | |
| Saeed Moaveni: Finite Element Analysis: Theory and Application with ANSYS, 4th Ed. | | | | |
| *1.12. Number of Main Reading Examples* |  | |  | |
| *Title* | *Number of examples* | | *Number of students* | |
| Klaus-Jurgen Bathe: Finite Element Procedures | | Free PDF online | | 10 |
|  | |  | |  |
|  | |  | |  |
| *1.13. Quality Assurance* | | | | |
| According to ISO 9001 standard set on the Faculty of Maritime Studies Rijeka. | | | | |

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.