

## Subject card

|                                             |                                                                                                                                             |                                                          |                                         |                                     |                                                |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------|------------|-----|
| Subject name and code                       | Basics of Machine Design and Engineering Graphics - lecture, PG_00199125                                                                    |                                                          |                                         |                                     |                                                |            |     |
| Field of study                              | Marine Hydrography                                                                                                                          |                                                          |                                         |                                     |                                                |            |     |
| Date of commencement of studies             | October 2027                                                                                                                                |                                                          | Academic year of realisation of subject |                                     | 2027/2028                                      |            |     |
| Education level                             | Bachelor's studies                                                                                                                          |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study |            |     |
| Mode of study                               | full-time studies                                                                                                                           |                                                          | Mode of delivery                        |                                     | at the university                              |            |     |
| Year of study                               | 1                                                                                                                                           |                                                          | Language of instruction                 |                                     | Polish                                         |            |     |
| Semester of study                           | 1                                                                                                                                           |                                                          | ECTS credits                            |                                     | 1.0                                            |            |     |
| Learning profile                            | practical                                                                                                                                   |                                                          | Assessment form                         |                                     | credit                                         |            |     |
| Conducting unit                             |                                                                                                                                             |                                                          |                                         |                                     |                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                          |                                                          | dr inż. Leszek Flis                     |                                     |                                                |            |     |
|                                             | Teachers                                                                                                                                    |                                                          |                                         |                                     |                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                 | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                       | 12.0                                                     | 0.0                                     | 0.0                                 | 0.0                                            | 0.0        | 12  |
|                                             | E-learning hours included: 0.0                                                                                                              |                                                          |                                         |                                     |                                                |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                           | Participation in didactic classes included in study plan |                                         | Participation in consultation hours |                                                | Self-study | SUM |
|                                             | Number of study hours                                                                                                                       | 12                                                       |                                         | 2.0                                 |                                                | 11.0       | 25  |
| Subject objectives                          | Teaching the basics on the notation of construction, structure and operation of machine elements principles of their calculation and design |                                                          |                                         |                                     |                                                |            |     |

| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                                                                                                                | Method of verification                                                                             |
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|                                                                | [HML3-U10] is able to design - in accordance with the given specification - and make a simple device, object, system or implement a process typical for the field of study, using appropriately selected methods, techniques, tools and materials                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | is able to design according to a given specification a selected machine part using CAD/CAE computer aided design techniques                                                                                                    | [SU2] presentation/project/paper/report                                                            |
|                                                                | [HML3-U04] is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks in the design of basic machine parts                                                                         | [SU2] presentation/project/paper/report                                                            |
|                                                                | [HML3-U01] is able to plan and conduct experiments, including computer simulations, interpret the results obtained and draw conclusions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | is able to plan and carry out experiments, including computer simulations, interpret the results obtained and draw conclusions on the prototyping of basic machine structures                                                  | [SU2] presentation/project/paper/report                                                            |
|                                                                | [HML3-W12] knows and understands, at an advanced level, the key processes occurring in the life cycle of devices, facilities, and technical systems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | knows at an advanced level the principles of machine design using CAD/CAE computer methods;                                                                                                                                    | [SW2] presentation/project/paper/report                                                            |
|                                                                | [HML3-W03] knows and understands, at an advanced level, directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | knows at an advanced level methods of designing machine components and criteria for evaluating the design of machine components and the relevance of these criteria                                                            | [SW2] presentation/project/paper/report                                                            |
|                                                                | [HML3-W01] knows and understands, at an advanced level, selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study                                                                                                                                                                                                                                                                                                                                                                  | knows at an advanced level the concepts of standardisation in the design and unification of machine components and assemblies                                                                                                  | [SW2] presentation/project/paper/report                                                            |
|                                                                | [HML3-K02] is ready to correctly determine the priorities in professional work for the implementation of a task specified by himself/ herself or others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | is ready to set priorities in their professional work in order to carry out tasks set by themselves or others in areas requiring basic technical knowledge of the construction, design, and engineering of technical equipment | [SK2] presentation/project/paper/report<br>[SK8] observation of student's independent or team work |
| Subject contents                                               | <p>Engineering Graphics: Projection. Principles of orthogonal projection in technical drawings. Dimensioning. Basic types of mechanical technical drawings. Tolerance and fit. Indicating the surface finish of objects. Rules for creating drawings of machine parts and connections. Application of CAD in creating technical documentation.</p> <p>Fundamental of Machine Design: Designing ship structural components. Calculating allowable stress for static and fatigue loads. Detachable connections. Non-detachable connections. Bearings. Flexible elements. Couplings and brakes. Shafts and axles. Gears. Ship structural components. Fundamentals of computer-aided engineering (CAE) calculations.</p> |                                                                                                                                                                                                                                |                                                                                                    |
| Prerequisites and co-requisites                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                    |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                                                                                                                              | Percentage of the final grade                                                                      |
|                                                                | project or presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 51.0%                                                                                                                                                                                                                          | 100.0%                                                                                             |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | DOBRZAŃSKI T.: Rysunek techniczny maszynowy. WNT, Warszawa 2014. (in Polish)<br>SZOPA T.: Zasady projektowania i obliczeń inżynierskich. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2013. (in Polish)              |                                                                                                    |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SINGH A.: Fundamentals of Machine Design. Volume 1 and 2. UK, Cambridge University Press, 2017.                                                                                                                                |                                                                                                    |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                |                                                                                                    |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                |                                                                                                    |

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| Work placement | Not applicable |
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