



COURSE SPECIFICATION

| | |
|----------------------------|----------------------------------|
| Course code | M#1-S1-ME-402 |
| Course title in Polish | Podstawy konstrukcji maszyn I |
| Course title in English | Fundamentals of Machine Design I |
| Valid from (academic year) | 2019/2020 |

GENERAL INFORMATION

| | |
|------------------------|--|
| Programme of study | MECHANICAL ENGINEERING |
| Level of qualification | first-cycle |
| Type of education | academic |
| Mode of study | full-time |
| Specialism | all |
| Department responsible | Department of Machine Design |
| Course leader | Jaroslaw Galkiewicz, BEng, PhD, DSc |
| Approved by | |

COURSE OVERVIEW

| | |
|-------------------------------|--|
| Course type | basic |
| Course status | compulsory |
| Language of instruction | English |
| Semester of delivery | semester 4 |
| Pre-requisites | Technical Drawing, Engineering Mechanics, Strength of Materials, Manufacturing Engineering, Metal Science |
| Examination required (YES/NO) | NO |
| ECTS value | 2 |

| Mode of instruction | lecture | class | laboratory | project | seminar |
|---------------------------|-----------|-------|------------|---------|---------|
| No. of hours per semester | 30 | | | | |

LEARNING OUTCOMES

| Category of outcome | Out-come code | Course learning outcomes | Corresponding programme outcome code |
|---------------------|---------------|---|--------------------------------------|
| Knowledge | W01 | They will have a basic knowledge of the principles of design of mechanical components and systems. | MiBM_W08 |
| | W02 | They will have knowledge of engineering calculation methods used in mechanics, mechanical design and strength of materials, especially the strength of bars and bar systems, material tension, strength of beams, slabs, shells and thick-walled cylinders subjected to combined loading. | MiBM1_W19 |
| Skills | U01 | They will be able to develop technical documentation required for an engineering project and write a report discussing the results. | MiBM1_U04 |
| | U02 | They will be able to identify and define an engineering problem; they are able to develop specifications that meet the design requirements necessary to solve an engineering problem, as appropriate to their specialism field of study. | MiBM1_U10 |
| Competence | K01 | They will be aware of and understand the relationships between engineering and non-engineering activities, including their impact on the environment and the responsibility for decision-making | MiBM1_K02 |

COURSE CONTENT

| Type of instruction* | Topics covered |
|----------------------|--|
| lecture | 1. The subject, basic principles of design process. |
| | 2. Design against static load. |
| | 3. Fatigue strength assessment with fundamentals of fracture mechanics |
| | 4. Engineering materials. |
| | 5. Detachable joints |

*) Please delete rows in the table above that are not applicable.

ASSESSMENT METHODS

| Outcome code | Methods of assessment <i>(Mark with an X where applicable)</i> | | | | | |
|--------------|--|---------------------|------|---------|--------|-------|
| | Oral examination | Written examination | Test | Project | Report | Other |
| W01 | | | x | | | |
| W02 | | | x | | | |
| U01 | | | x | | | |
| U02 | | | x | | | |
| K01 | | | x | | | x |

ASSESSMENT TYPE AND CRITERIA

| Mode of instruction* | Assessment type | Assessment criteria |
|----------------------|-----------------------------------|---|
| lecture | non-examination assessment | The pass mark is a minimum of 50% for the final in-class test, extra credits for an in-class activity |

*) Please delete rows in the table above that are not applicable.

OVERALL STUDENT WORKLOAD

| ECTS weighting | | | | | | | |
|----------------|--|------------------|---|-----|---|---|------|
| | Activity type | Student workload | | | | | Unit |
| | | L | C | Lab | P | S | |
| 1. | Scheduled contact hours | 30 | | | | | h |
| 2. | Other contact hours (office hours, examination) | 2 | | | | | h |
| 3. | Total number of contact hours | 32 | | | | | h |
| 4. | Number of ECTS credits for contact hours | 1.3 | | | | | ECTS |
| 5. | Number of independent study hours | 18 | | | | | h |
| 6. | Number of ECTS credits for independent study hours | 0.7 | | | | | ECTS |
| 7. | Number of practical hours | 0 | | | | | h |
| 8. | Number of ECTS credits for practical hours | 0,0 | | | | | ECTS |
| 9. | Total study time | 50 | | | | | h |
| 10. | ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i> | 2 | | | | | ECTS |

READING LIST

1. V. B. Bhandari, Design of Machine Elements, Tata McGraw Hill Education Private Limited, 2010
2. R. G. Budynas, J. K. Nisbett, Shigley's Mechanical Engineering Design, McGraw-Hill Education, 2015
3. J. M. Gere, B. J. Goodno, Mechanics of Materials, Eighth Edition, SI, Cengage Learning, 2013
4. Wei Jiang, Analysis and Design of Machine Elements, JohnWiley & Sons Singapore Pte. Ltd, 2019
5. L. W. Kurmaz, O. L. Kurmaz, Podstawy konstruowania węzłów i części maszyn, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2011 (in Polish)