## 1.3. Module/ course form

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| To be completed by Course Team | Module name :  **ENGINEERING MECHANICS** | | | | | | Module code: | | |
| Course name:  **ENGINEERING MECHANICS** | | | | | | Course code: | | |
| Faculty:  **INSTITUTE OF TECHNOLOGY** | | | | | | | | |
| Field of study:  **CIVIL BUILDING** | | | | | | | | |
| Mode of study : | | | Learning profile: | | | Speciality: | | |
| Year/ semester: | | | Module/ course status: | | | Module/ course language:  **ENGLISH** | | |
| Type of classes | lecture | lessons | | lab | project | | tutorial | other (please specify) |
| Course load | **30** | **15** | |  |  | |  |  |

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| Module/ course coordinator | dr hab. inż. Jarosław Górski, prof. PWSZ |
| Lecturer | dr hab. inż. Jarosław Górski, prof. PWSZ |
| Module/ course objectives | Students should be able to: determinate internal forces and influence lines for statically determinate beam structures; use influence lines to analyse the extreme loading conditions, calculate stresses and strains (axial tension and compression, bending, torsion), define stability of beams and limit load-carrying capacity of a cross-sections. |
| Entry requirements | No requirements |

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| **LEARNING OUTCOME** | | |
| Nr | LEARNING OUTCOME DESCRIPTION | Learning outcome reference |
| 01 | Basic knowledge of statistically determinate planar structures. | K\_W04 |
| 02 | Is able to determine of internal forces diagrams in planar structures. | K\_U02 |
| 03 | Is able to draw influence lines to analyse the extreme loading conditions | K\_U02 |
| 04 | Is able to describe stress and strain in: axial tension and compression, bending, and torsion of rods and beams, define stability of beams and limit load-carrying capacity of a cross-sections. | K\_U01 |

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| **CURRICULUM CONTENTS** |
| **Lecture** |
| Structural analysis (statistically determinate planar structures): internal forces, differential equations of equilibrium, determination of reactions and internal forces in beams, frames, three-hinged systems, trusses and complex systems, influence lines of reactions and internal forces for beams, frames and trusses, extreme loading.  Strength of materials: definitions of stress and strain; plane stress and plane strain, Hooke’s law (constitutive relations), axial tension and compression), uniaxial and biaxial bending, bending with tension/compression, free torsion of rods, shear stresses at bending, joints of structural elements; compound and multiple beams, composite beams (tension/compression, bending), deflection line of a beam (Euler’s equation), stability of beams, strength criteria, equivalent stresses, limit load-carrying capacity of a cross-section (axial tension/compression, bending, tension/compression with bending). |
| Tutorial |
| Solving problem related to: structural analysis and strength of materials. |

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| Basic literature | 1. Hibbeler R.C. Mechanics of materials. Printice Hall 1997. 2. Hibbeler R.C. Structural analysis. Printice Hall 1995. |  |
| Additional literature | 1. Carpinteri A. Structural mechanics. A unified approach. E & FN Spon 1997 2. Callister W.D. Materials science and engineering. John Wiley&Sons 2000 3. Meriam J.L., Kraige, L.G., Engineering Mechanics. Statics. John Wiley & Sons 1998 |  |

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| Teaching methods | | Lecture, discussion | |
| Assessment method | | | Learning outcome number |
| Written exam | | | 01,02,03,04 |
| Form and terms of an exam | Written exam | | |

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| **STUDENT WORKLOAD** | |
|  | Number of hours |
| Participation in lectures | 30 |
| Independent study of lecture topics | 35 |
| Participation in tutorials, labs, projects and seminars | 15 |
| Independent preparation for tutorials\* | 15 |
| Preparation of projects/essays/etc. \* |  |
| Preparation/ independent study for exams | 30 |
| Participation during consultation hours | 2 |
| Other |  |
| **TOTAL student workload in hours** | 127 |
| **Number of ECTS credit per course unit** | **5** |
| Number of ECTS credit associated with practical classes | **1,2** |
| Number of ECTS for classes that require direct participation of professors | **1,5** |