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| **Course code** | TCE\_CC7 |
| **Type and description** |  |
| **ECTS credit** | 1 |
| **Course name** | Computational methods in non-linear solid mechanics I |
| **Course name in Polish** | Podstawy metod obliczeniowych nieliniowej mechaniki ciała stałego I |
| **Language of instruction** | English |
| **Course level** | 8 PRK |
| **Course coordinator** | Zdzisław Więckowski |
| **Course instructors** | Paulina Świątkiewicz |
| **Delivery methods and course duration** | |  | **Lecture** | **Tutorials** | **Laboratory** | **Project** | **Seminar** | **Other** | **Total of teaching hours during semester** | | --- | --- | --- | --- | --- | --- | --- | --- | | Contact hours | 15 |  |  |  |  | 0 | 15 | | E-learning | No | No | No | No | No | No |  | | Assessment criteria (weightage) | 1,00 |  |  |  |  | 0,00 |  | |
| **Course objective** | To present current knowledge on computational methods of non-linear solid mechanics. |
| **Learning outcomes** | After completing the course, a student will be able to:  1. recognize and formulate the problems of non-linear mechanics (W1 P8S\_EG, U1 P8S\_UW, U4 P8S\_UU);  2. understand the basic iterative procedures of solving non-linear problems (W1 P8S\_EG, U1 P8S\_UW, U4 P8S\_UU);  3. understand the computational methods applied to problems of non-linear solid mechanics (W1 P8S\_EG, U1 P8S\_UW, U4 P8S\_UU). |
| **Assessment methods** | written test |
| **Prerequisites** |  |
| **Course content with delivery methods** | LECTURE:  Variational formulation of non-linear solid mechanics problems: geometrical non-linearities, physical non-linearities: e.g. plasticity and frictional contact problems.  Basic and advanced procedures of solving non-linear problems.  Application of the finite element method and point-based methods to non-linear engineering problems |
| **Basic reference materials** | 1. O. C. Zienkiewicz and R. L. Taylor, The Finite Element Method, volume I, McGraw-Hill, London, 5th edition, 2000.  2. O. C. Zienkiewicz and R. L. Taylor, The Finite Element Method, volume II. McGraw-Hill, London, 5th edition, 2000.  3. K-J. Bathe, Finite Element Procedures in Engineering Analysis, Prentice-Hall, Englewood Cliffs, 1982.  4. G. Dhatt and G. Touzot, The Finite Element Method Displayed, John Wiley & Sons, Chichester, 1984.  5. T. J. R. Hughes, The Finite Element Method: Linear Static and Dynamic Finite Element Analysis, Prentice-Hall International, Inc., New Jersey, 1987. |
| **Other reference materials** |  |
| **Average student workload outside classroom** | 15 hours |
| **Comments** |  |
| **Last update** | 5 April, 2019 |