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| The title of the course | **Numerical methods for engineers** |
| Faculty | [Faculty of Mechanical Engineering and Computer Science](http://eng.ath.bielsko.pl/index.php/faculties/gerg) |
| The level of studies | Undergraduate (BA)  Postgraduate (MA)  Engineer (BSc) |
| Semester | Winter/summer |
| The form of classes and number of hours | Lecture/Project |
| Language of instruction | English |
| The number of ECTS | 2 |
| Teacher | Dr hab. inż. Andrzej Urbaś, prof. UBB |
| The aims of the course  (maximum 500 characters) | The aim of the course is to learn the basic numerical methods used in technical sciences (mechanical engineering and science) using Matlab software. |
| The content of the course: main topics and key ideas | 1. Systems of linear equations  2. Interpolation  3. Approximation  4. [Numerical](http://www.numerical-methods.com/numint.htm) differentiation  5. [Numerical integration](http://www.numerical-methods.com/numint.htm)  6. Ordinary differential equation |
| Didactics methods | multimedia presentation, project |
| Course requirements | Exams |
| Literature (basic and supplementary) | 1. Kiusalaas J., Numerical methods in Engineering with Matlab, Cambridge University Press, 2005  2. Chapra S., Applied Numerical Methods With MATLAB for Engineers and Scientists  3. Chapra S., Canale R., Numerical methods for engineers, 2009  4. [Vaughan Griffiths](http://www.google.pl/search?hl=pl&tbo=p&tbm=bks&q=inauthor:%22D.+Vaughan+Griffiths%22) D., Smith I.M., Numerical Methods for Engineers,1991  5. Gupta S.K., Numerical Methods for Engineers, 2014 |
| The effects of the education   * knowledge * skills * social competences | knowledge: student has a basic knowledge of numerical methods used in mechanical engineering, knows their algorithms, assumptions and limitations  skills: student can choose a numerical method to a given issue and solve it using MATLAB  social competences: student is able to work in a group in order to describe the issues, the choice of the solution and analysis of the results. |