



Subject card

| | | | | | | | |
|---|--|---|-------------------------------------|------------|--|---------|-----|
| Subject name and code | Mathematical Analysis I, PG_00060215 | | | | | | |
| Field of study | Technical Physics | | | | | | |
| Date of commencement of studies | October 2024 | Academic year of realisation of subject | | | 2024/2025 | | |
| Education level | first-cycle studies | Subject group | | | Obligatory subject group in the field of study Subject group related to scientific research 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 | | | 10.0 | | |
| Learning profile | general academic profile | Assessment form | | | exam | | |
| Conducting unit | Zakład Fizyki Zderzeń Elektronowych -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Maciej Kuna | | | | | |
| | Teachers | dr Maciej Kuna dr hab. inż. Maciej Demianowicz | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 60.0 | 60.0 | 0.0 | 0.0 | 0.0 | 120 |
| | 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 | 120 | 10.0 | | 120.0 | 250 | |
| Subject objectives | Endowment of student to mathematical knowledge helping technical subjects | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K6_W03] has systematized knowledge of higher mathematics, including algebra, analysis, probability theory and numerical methods, allowing for basic description, understanding and modelling of physical phenomena and some technical processes | Student calculate limits of sequences of numbers and functions. Study monotonicity and extremas of a function. Student knows basic notions of differential calculus of functions of one variable. Can calculate indefinite integral using methods integration by parts and integration by substitution. Student understands mathematical theorems and it uses with they of solving exercises. | | | [SW1] Assessment of factual knowledge | | |
| | [K6_U01] learns independently, obtains information from literature, databases and other properly selected sources | Student understands the importance of studying by himself. Student is practising by himself. | | | [SU2] Assessment of ability to analyse information | | |

| Subject contents | <p>Elements of logic and set theory.</p> <p>Functions and relationships</p> <p>Numerical sets</p> <p>Introduction to metric spaces</p> <p>Sequences and Series</p> <p>Metric spaces</p> <p>Limit and continuity of function</p> <p>Properties of continuous functions</p> <p>Derivative of a function of one variable</p> <p>Mean value theorems and their applications</p> <p>Derivatives of functions of many variables</p> <p>Function extremes</p> <p>The inverse function theorem and its applications</p> <p>Integrals</p> | | | | | | | | | | | |
|---------------------------------|--|--|--|--------------------------|-------------------|-------------------------------|-------------|-------|-------|----------|-------|-------|
| Prerequisites and co-requisites | Student knows basic mathematical notions | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1"> <thead> <tr> <th data-bbox="456 1274 794 1301">Subject passing criteria</th> <th data-bbox="801 1274 1139 1301">Passing threshold</th> <th data-bbox="1145 1274 1473 1301">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1310 794 1337">Examination</td> <td data-bbox="801 1310 1139 1337">60.0%</td> <td data-bbox="1145 1310 1473 1337">50.0%</td> </tr> <tr> <td data-bbox="456 1346 794 1373">Exercise</td> <td data-bbox="801 1346 1139 1373">60.0%</td> <td data-bbox="1145 1346 1473 1373">50.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | Examination | 60.0% | 50.0% | Exercise | 60.0% | 50.0% |
| Subject passing criteria | Passing threshold | Percentage of the final grade | | | | | | | | | | |
| Examination | 60.0% | 50.0% | | | | | | | | | | |
| Exercise | 60.0% | 50.0% | | | | | | | | | | |
| Recommended reading | Basic literature | <p>R. Rudnicki "Wykłady z analizy matematycznej" PWN Warszawa 2020</p> <p>D.A. McQuarrie "Matematyka dla przyrodników i inżynierów" Tom 1, PWN, Warszawa 2012</p> <p>K.A. Stroud, D.J. Booth "Matematyka od zera dla inżyniera" Pęta 2021</p> <p>W. Krysicki, L. Włodarski "Analiza matematyczna w zadaniach" Tom I, PWN Warszawa 2023</p> | | | | | | | | | | |
| | Supplementary literature | <p>L. Górniewicz, R.S. Ingarden "Analiza matematyczna dla fizyków" Tom 1, PWN Warszawa 1981</p> <p>K. Maurin "Analiza część 1" PWN Warszawa 2010</p> <p>K. Jankowska, T. Jankowski, Zbiór zadań z matematyki. Wydawnictwo Politechniki Gdańskiej, 2009</p> | | | | | | | | | | |

| | eResources addresses | Adresy na platformie eNauczenie: |
|--|--|----------------------------------|
| Example issues/ example questions/ tasks being completed | <p>Find extremum of given function $f(x)$</p> <p>Find the limit of given function $f(x)$</p> <p>Calculate the integral of given function $f(x)$</p> <p>Calculate the derivative of given function $f(x)$</p> <p>Expand of given function $f(x)$ in series</p> | |
| Work placement | Not applicable | |

Document generated electronically. Does not require a seal or signature.