

| Bialystok University of Technology | | | | | | | | | |
|---|---|----|----|---|----|----|-----------------------|---|---------------------------------------|
| Field of study | Computer Science | | | | | | | Degree level and programme type | Engineer's degree full-time programme |
| Specialization/ diploma path | --- | | | | | | | Study profile | academic |
| Course name | Calculus | | | | | | | Course code | FCS-00002 |
| | | | | | | | | Course type | obligatory |
| Forms and number of hours of tuition | L | C | LC | P | SW | FW | S | Semester | 3 |
| | 30 | 30 | | | | | | No. of ECTS credits | 6 |
| Entry requirements | | | | | | | | | |
| Course objectives | The course will introduce the concepts of limit of a sequence, convergence of number series, continuity and derivatives of real functions of one variable and n-variables, indefinite and definite integrals of functions of one variable. An emphasis will be put on applications of definite integrals and differential calculus of real functions of one variable and n-variables. | | | | | | | | |
| Course content | <p>Lecture:</p> <ol style="list-style-type: none"> Sets and their bounds. Real functions of one variable and n-variables, properties of these functions. Limit of a sequences, convergence of number series, continuity and derivatives of real functions of one variable. Limit of a sequences, convergence of number series, continuity and derivatives of real functions of n-variables, indefinite. Definite integrals of functions of one variable, applications of derivatives and integrals. Fourier Series. <p>Exercises:</p> <ol style="list-style-type: none"> Sets and their bounds. Real functions of one variable and n-variables, properties of these functions. Limit of a sequences, convergence of number series, continuity and derivatives of real functions of one variable. Limit of a sequences, convergence of number series, continuity and derivatives of real functions of n-variables, indefinite. Definite integrals of functions of one variable, applications of derivatives and integrals. Fourier Series. | | | | | | | | |
| Teaching methods | informative lecture, lecture problem, classic problem method, subject exercises, | | | | | | | | |
| Assessment method | Lectures - written exam, exercises - written test. | | | | | | | | |
| Symbol of learning outcome | Learning outcomes | | | | | | | Reference to the learning outcomes for the field of study | |
| LO1 | knows how to use in different context the concept of a limit of a sequence, convergence of number series, continuity of real functions of one variable and n-variables. | | | | | | | K_W01 K_U01 | |
| LO2 | calculates derivatives of a function of one variable and partial derivatives of a function of n-variables. | | | | | | | K_W01 K_U01 | |
| LO3 | calculates indefinite and definite integrals of functions of one variable applying basic methods of integration. | | | | | | | K_W01 K_U01 | |
| LO4 | solves problems of optimization using tools of differential calculus of real functions of one variable and n-variables. | | | | | | | K_W01 K_U01 | |
| LO5 | applies elements of integral calculus of real functions of one variable and n-variables to geometric calculations. | | | | | | | K_W01 K_U01 | |
| Symbol of learning outcome | Methods of assessing the learning outcomes | | | | | | | Type of tuition during which the outcome is assessed | |
| LO1 | written tests, written exam | | | | | | | L, C | |
| LO2 | written tests, written exam | | | | | | | L, C | |
| LO3 | written tests, written exam | | | | | | | L, C | |
| LO4 | written tests, written exam | | | | | | | L, C | |
| LO5 | written tests, written exam | | | | | | | L, C | |
| Student workload (in hours) | | | | | | | No. of hours | | |
| Calculation | 1 - Participation in lectures - 2x15h | | | | | | | 30 | |
| | 2 - Participation in classes - 2x15h | | | | | | | 30 | |
| | 3 - Doing homeworks - | | | | | | | 70 | |
| | 4 - Preparation to the exam - | | | | | | | 13 | |
| | 5 - Participation in student-teacher sessions - | | | | | | | 5 | |
| | 6 - Presence during the exam - | | | | | | | 2 | |
| TOTAL: | | | | | | | 150 | | |
| Quantitative indicators | | | | | | | HOURS | No. of ECTS credits | |
| Student workload - activities that require direct teacher participation | | | | | | | 67 (5)+(2)+(1)+(6) | 2.7 | |
| Student workload - practical activities | | | | | | | 100 (3)+(2) | 4.0 | |
| Basic references | <ol style="list-style-type: none"> Marsden, Jerrold., and Alan. Weinstein. Calculus I. 2nd ed. New York: Springer-Verlag, 1985. Print. Undergraduate Texts in Mathematics. Weir, Maurice D., Joel. Hass, Frank R. Giordano, and George B. Thomas. Thomas' Calculus. 11th Ed., Media Upgrade. ed. Boston: Pearson Addison Wesley, 2008. Print. Stewart, James. Single Variable Calculus : Early Transcendentals. 7th Ed. Hybrid. ed. Belmont: Brooks/Cole : Cengage Learning, 2012. Print. | | | | | | | | |
| Supplementary references | <ol style="list-style-type: none"> Auvil, Daniel L. Calculus with Applications. Reading: Addison-Wesley Publ., 1993. Print. Adams, Robert Alexander. Single-variable Calculus. Don Mills: Addison-Wesley Publ., 1983. Print. | | | | | | | | |
| Organisational unit conducting the course | Department of Mathematics | | | | | | | Date of issuing the programme | |
| Author of the programme | dr Ewa Girejko | | | | | | | Feb. 18, 2022 | |

L - lecture, C - classes, LC - laboratory classes, P - project, SW - specialization workshop, FW - field work, S - seminar