# Course Descriptions None 2025-2026

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| Course Title | Calculus |
| Course Code | BENC1002 |
| ECTS Credits | 5,0 |
| Assessment | Whole/Half Grades |

Period

| Period | Start | End | Mon | Tue | Wed | Thu | Fri |
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| 1 | 1-9-2025 | 17-10-2025 | X | | X | | L |

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| Level | Introductory |
| Coordinator | Niloufar Yousefimanesh For more information:n.yousefimanesh@maastrichtuniversity.nl |
| Language of instruction | English |
| Goals | After passing this course, students will be able to perform basic single-variable calculus operations. We will cover limits and continuity, differential calculus of a univariate function, inverse and transcendental functions, mean value theorem, integral calculus, sequences and series, an introduction to differential equations, and some approximation theory. In addition to the main facts and concepts, problem-solving strategies will be discussed. Throughout the course numerical and computational aspects are highlighted using standard computer programs like Wolfram Mathematica and MATLAB. Weekly exercises, presented and discussed in tutor groups, allow students to test and refine their understanding of the covered material. |
| Description | The course introduces some of the main mathematical tools, which must be known to modern business engineers. These include advanced integration techniques and the analysis of dynamical systems. The course offers students additional understanding of the role mathematics plays in modern society, the sciences and the business world. After completing this course students should be able to: 1.Calculate limits using the limit laws. 2.Calculate derivatives by applying the product rule, quotient rule, and chain rule, and combinations thereof. In addition, the student can use these techniques to find the local and absolute extreme values of a given function. 3.Calculate integrals using the standard techniques of integration (substitution rule, integration by parts, trigonometric integrals and substitutions, integration of rational functions by partial fractions) and is able to recognize which technique is best used in a given situation. 4.Solve separable first-order differential equations and can calculate the general solution of a first-order linear differential equation by means of an integrating factor. 5.Solve homogeneous second-order differential equations with constant coefficients and calculate a particular solution for nonhomogeneous equations using the method of undetermined coefficients. 6.Knows what infinite sequences and series are, and is able to compute limits of them. |
| Literature | University Calculus: Early Transcendentals in SI Units, 4th Edition Joel R. Hass, Maurice D. Weir, Global Edition |
| Prerequisites | The course unit assumes only prior knowledge acquired from Mathematics B as taught in pre-university programmes (VWO) on Dutch secondary schools (or equivalent). |
| Keywords | |
| Transitional Regulations | |
| Teaching methods | PBL / Lecture / Groupwork |
| Assessment methods | Written Exam / Assignment |
| Evaluation in previous academic year | For the complete evaluation of this course please click http://iwio-sbe.maastrichtuniversity.nl/rapporten.asp?referrer=codeUM |

This course belongs to the following programme / specialisation

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| Bachelor Business Engineering | Year 1 Compulsory Courses |