## **Course Descriptions Bachelor 2022-2023**

Course Title	Calculus		-					
Course Code	BENC1002							
ECTS Credits	5,0							
Assessment	Whole/Half Grades							
Period	Period	Start	End	Mon	Tue	Wed	Thu	Fri
	1	5-9-2022	14-10-2022		Х		Х	L
Level	Introductory							
Coordinator	Mathias Staudigl For more information:m.staudigl@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 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								
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	Bachelor Bus	siness Engine	ering		Year 1 Comp	oulsory Course	e(s)	