Course Descriptions None 2020-2021

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

Period

Period	Start	End	Mon	Tue	Wed	Thu	Fri
1	31-8-2020	16-10-2020		X		X	

Level	no level
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	PLEASE NOTE THAT THE INFORMATION ABOUT THE TEACHING AND ASSESSMENT METHOD(S) USED IN THIS COURSE IS WITH RESERVATION. THE INFORMATION PROVIDED HERE IS BASED ON THE COURSE SETUP PRIOR TO THE CORONAVIRUS CRISIS. AS A CONSEQUENCE OF THE CRISIS, COURSE COORDINATORS MAY BE FORCED TO CHANGE THE TEACHING AND ASSESSMENT METHODS USED. THE MOST UP-TO-DATE INFORMATION ABOUT THE TEACHING/ASSESSMENT METHOD(S) WILL BE AVAILABLE IN THE COURSE SYLLABUS. 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. Calculate with complex numbers, can plot them in the complex plane, is able to formulate and use DeMoivre's Theorem 5. 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. 6. Solve homogeneous second-order differential equations with constant coefficients and calculate a particular solution for nonhomogeneous equations using the method of undetermined coefficients.
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
Assessment methods	Written Exam
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 Business Engineering	Year 1 Compulsory Course(s)