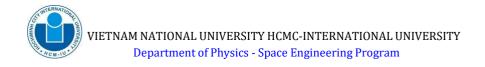### 8. Calculus 2 (MA003IU)

Course designation	*This course is a continuation of Calculus 1. Its aim to equip student with basis concepts of sequence, series, vector functions, functions of several variables, multiple integrals and their applications*
Semester(s) in which the course is taught	1, 2, summer semester
Person responsible for the course	Assoc. Prof. Mai Duc Thanh, Assoc. Prof. Tran Vu Khanh, Dr.Nguyen Minh Quan, Dr. Nguyen Anh Tu, Dr. Ta Quoc Bao.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lectures, assignments
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 170 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 50 (lectures) Private study including examination preparation, specified in hours: 120
Credit points/ECTS	4 credits/6.16 ECTS
Required and recommended prerequisites for joining the course	Previous course: Calculus 1 (MA001IU)

Course learning outcomes	Upon the successful completion of this course students will be able to:	
	Competency level	**Course learning outcome (CLO)**
	Knowledge	CLO1. Have basic knowledge of series, functions of several variables, multiple integrals (Program outcomes: a) CLO2. Have basic knowledge of vector calculus (Program outcomes: a)
	Skill	CLO3. Can compute partial derivatives, multiple integral (Program outcomes: a, j) CLO4. Can show the convergence of a sequence and a series and u, se power series to simplify computation. Can show the optimal problem using partial derivatives, can find the volume of an object in higher dimension by using the multiple integrals (Program outcomes: i, h)
	Attitude	CLO5. Confident when dealing with partial derivatives, multiple integrals. Comfortable with using partial derivatives and multiple integrals in practical situations. (Program outcome: j, k)

Content	*The description of the contents should clearly indicate the weighting of the content and the level.*
	Weight: lecture session (4 hours)
	Teaching levels: I (Introduce); T (Teach); U (Utilize)

Topic	Weight	Level
Sequences and Convergence	1	I, T
Series	1	I, T
Tests for Convergence	1	T, U
Power series	1	T, U
Representations of Functions as Power series	1	T, U
Taylor and Maclaurin series	1	T, U
Vector Functions and Space Curves, Limit and continuity of vector functions	1	I, T
Derivatives and Integrals of vector functions, Length of space curves	1	T, U
Functions of Several Variables, Limits and Continuity	1	I,T
Partial Derivatives, Tangent Plane and Linear Approximations	1	T, U
Chain Rules, Directional Derivatives and Gradient	1	T, U
Maximum and Minimum Values of Functions of two variables	1	T, U
Lagrange Multipliers and Applications	1	T, U
Double Integrals in Rectangles, Iterated Integrals	1	I, T
Double, Triple Integrals in General regions and Applications	2	T,U

Examination forms	Written examination
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	J. Stewart, *Calculus*, Thomson Learning, 7th edition, 2012.