APPROVED BY
Approved by
Dean of School of Applied
Mathematics
_____ Assylbek A. Issakhov
On 23.08.2022
Protocol No. 1

KAZAKH KBTU BRITISH
T E C H N I C A L
U N I V E R S I T Y

| DISCIPLINE CODE AND NAME MATH1213 Calculus – III	CREDITS RK & ECTS: 3 (5 ECTS)	PREREQUISITES: MATH1201 Calculus-I, MATH1202 Calculus-II
TEACHER: Artem V Sinitsa, MSc, Senior-Lecturer	TEACHER'S CONTACTS: Email: a.sinitsa@kbtu.kz,	TIME & PLACE OF CLASSES: According to the approved timetable (MS Teams)

Aim of the course

Calculus or mathematical analysis is the essential part of the mathematical background required of mathematicians, economists, engineers, physicists, and other scientists. This requirement reflects the importance and wide applications of the subject matter. The course is designed for IT and engineering specialties students. This course is also intended to provide students with a thorough understanding of the theory and application of the analysis of functions with complex variables. The aim of this course is to familiarize students with the basic concepts of the analysis of functions of a complex variable, and their various ap-plications in solving physical problems, the formation of a holistic system of knowledge about the analysis of the functions of a complex variable and the development of skills to use it for the study of physical processes.

Classes schedule and assignments

Week	Theme / module	Format of conducting classes	T/SIS requirements
1	Line Integrals and Vector Fields.	Interactive lesson (discussion)	SIS 1
2	Conservative fields and general integral formulas.	Interactive lesson (discussion)	SIS 2
3	Surface Integrals.	Interactive lesson (discussion)	SIS 3
4	Divergence theorem.	Interactive lesson (discussion)	SIS 4 Quiz-1
5	Integrals depending on parameter.	Interactive lesson (discussion)	SIS 5
6	The Eulerian Integrals.	Interactive lesson (discussion)	SIS6
7	The algebra and calculus of complex numbers.	Interactive lesson (discussion)	SIS 7 Midterm assessment
8	Complex variable functions.	Interactive lesson	SIS 8
		(discussion)	
9	Differentiation of complex variable functions.	Interactive lesson (discussion)	SIS 9
10	Integration of complex variable functions	Interactive lesson (discussion)	SIS 10
11	Consequences of Cauchy's integral theorem.	Interactive lesson (discussion)	SIS 11 Quiz-2
12	Representing analytic functions as series.	Interactive lesson (discussion)	SIS 12
13	Residue calculus and application of contour integration.	Interactive lesson (discussion)	SIS 13
14	Applications of complex function theory.	Interactive lesson (discussion)	SIS 14
15	Variational principles of conformal mappings.	Interactive lesson (discussion)	SIS 15

- **COURSE ASSESSMENT PARAMETERS***

Quiz-2; 7,5; 12.5%
SIS; 15; 25%
Quiz-1; 7,5; 12.5%
Endterm; 15; 25%
Midterm; 15; 25%
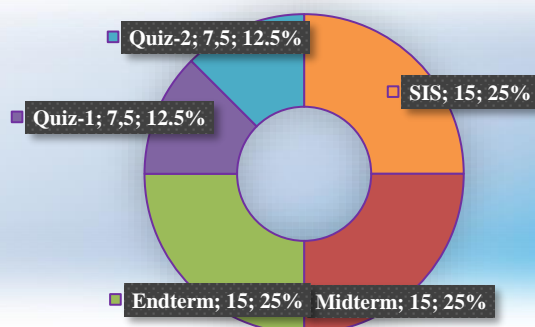
Main literature:

Academic Handbook	Link to the M-Teams:	Tasks and policy of the course:

Compiled by:
MSc, Senior-Lecturer _____ **Sinitsa A.V.**