Zachodniopomorski Uniwersytet Technologiczny w Szczecinie

Faculty of Chemical Technology and Engineering

Field of study	Chemical Engineering		
Mode of study	stationary	*Level*	first cycle
Graduate's qualification	inżynier		
Area(s) of study	nauki techniczne		
Educational profile	general academic		
Module			
Course unit	**Mathematics II**		
Code	ChEn_1A_S_B01b		
Field of specialisation			
Administering faculty	Studium Matematyki		
ECTS	6,0	*ECTS (forms)*	6,0
Form of course credit	examination	*Language*	english
Electives		*Elective group*	

Form of instruction	Code	Semester	Hours	ECTS	Weight	Credit
lecture	W	2	30	4,0	0,50	examination
lecturing course	A	2	30	2,0	0,50	credits

Leading teacher	Ewert-Krzemieniewski Stanisław (Stanislaw.Ewert-Krzemieniewski@zut.edu.pl)
Other teachers	Ewert-Krzemieniewski Stanisław (Stanislaw.Ewert-Krzemieniewski@zut.edu.pl)

Prerequisites	
W-1	Student knows the basics of high school mathematics.

Module/course unit objectives	
C-1	Consolidation of knowledge related to mathematics.
C-2	Developing student's ability to solve mathematical problems.
C-3	Improving student's awareness of the need for continuous education and professional development.

Course content divided into various forms of instruction		*Number of hours*
T-W-1	CONTENT A: 1) Introduction to functions of more than one variable and partial differentiation. 2) Vector differential calculus. 3) Vector integral calculus. 4) Series and approximation. B: 1) Complex numbers. 2) Algebra of matrices. 3) Systems of linear equations. 4) Vectors in n-dimensional space, dot product. 5) Cross product. 6) A line and a plane in 3-dimensional space. 7) Basic curves and surfaces in a 3-dimensional space. 8) Eigenvalues and eigenvectors.	30
T-A-1	Solving tasks in the field of knowledge presented at lectures.	30

Student workload - forms of activity		*Number of hours*
A-W-1	Participation in lectures	30
A-W-2	Self-study of the literature	86
A-W-3	Written and oral exam	4
A-A-1	Participation in classes	30
A-A-2	Self-study of the literature	26
A-A-3	Consultations	4

Teaching methods / tools	
M-1	Lecture
M-2	Classes

Evaluation methods (F - progressive, P - final)		
S-1	P	Lecture - written exam

Evaluation methods (F - progressive, P - final)

S-2	P	Lecture - oral exam
S-3	F	Classes - written tests

Designed learning outcomes	Reference to the learning outcomes designed for the fields of study	Reference to the learning outcomes defined for the particular areas of education	Reference to learning outcomes leading to the degree of "inżynier"	Course objectives	Course content	Teaching methods	Evaluation methods
Knowledge							
ChEn_1A_B01b_W01 LEARNING OUTCOMES On successful completion of the course students shoul be able to: 1. Demonstrate competence to study further technical university level mathematics as required in their program of study. 2. Demonstrate mathematical knowledge and skills in the areas of calculus, functions, vectors and complex numbers. 3. Demonstrate improved analytical ability, in particular their skills at problem-solving.	ChEn_1A_W01	P6S_WG_TA11	P6S_WG_IA11	C-1	T-W-1	M-1	S-1 S-2
Skills							
ChEn_1A_B01b_U01 Student can use the acquired knowledge to solve mathematical problems.	ChEn_1A_U01 ChEn_1A_U05 ChEn_1A_U11	P6S_UU P6S_UW_TA11 P6S_UW_TA12	P6S_UW_IA12	C-2	T-A-1	M-2	S-3
Other social / personal competences							
ChEn_1A_B01b_K01 Student is aware of the need for continuous education and professional development in the field of mathematics.	ChEn_1A_K02	P6S_KO		C-3	T-A-1 T-W-1	M-1 M-2	S-1 S-2 S-3

Required reading

1. Jeffrey, Alan, Advanced Engineering Mathematics, Harcour/Academic Press, any edition

Supplementary reading

1. Glyn, James, Advanced modern engineering mathematics, Prentice Hall, 2011

2. Croft, Tony, Mathematics for engineers, Pearson Prentice Hall, 2015