

## **Faculty of Chemical Technology and Engineering**

Mode of study	Field of st	tudy	Chem	nical Engineering								
Graduate's qualification   inzynier   nauki techniczne   general academic   general academic   Gode   GhEn JA S_801b	-		stationary level first sycle					<b>~</b> 1				
Area(s) of study   nauki techniczne   Educational profile   general academic   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   Electuring course   A   2   30   4,0   0,50   examination   Lecturing course   A   2   30   2,0   0,50   credits   Leading teacher   Ewert-Krzemieniewski Stanisław (Stanisław, Ewert-Krzemieniewski@zut.edu.pl)   Prerequisites   W-1   Student knows the basics of high school mathematics.  Module/course unit objectives   C-2   Developing student's ability to solve mathematics.  Module/course unit objectives   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			-	-	WTil	Ch						
Educational profile   general academic			<u> </u>									
Module Course unit Code ChEn_1A_S_B01b Field of specialisation Administering faculty Studium Matematyki ECTS												
Course unit			90				-					
Code   ChEn_1A_S_B01b		nit	Math	ematics II			-					
ECTS 6.0   ECTS (forms) 6,0   ECTS (forms) 6,0   Electives   Electives   Elective group   Electives   Elective group   Electives   Elective group   Elective group   Electives   Elective group   Elective group   Elective   Elective group   Elective   Ele		nc .					-					
ECTS 6.0   ECTS (forms) 6,0   ECTS (forms) 6,0   Electives   Electives   Elective group   Electives   Elective group   Electives   Elective group   Elective group   Electives   Elective group   Elective group   Elective   Elective group   Elective   Ele		nocialisation	CITEII	_1A_3_B01b			- (					
ECTS 6.0   ECTS (forms) 6,0   ECTS (forms) 6,0   Electives   Electives   Elective group   Electives   Elective group   Electives   Elective group   Elective group   Electives   Elective group   Elective group   Elective   Elective group   Elective   Ele			C+udi	um Matamatuki			- \					
Electives		ering racuity	1	ин матешатукі		6.0	- \ <u> </u>					
Electives   Elective group			<u> </u>		+		_					
Form of instruction   Code   Semester   Hours   ECTS   Weight   Credit		ourse credit	examination		+	english						
lecture			<u> </u>				T					
Leading teacher   Ewert-Krzemieniewski Stanisław (Stanisław.Ewert-Krzemieniewski@zut.edu.pl)	Form of ir	nstruction	Code	Semester	Hours	ECTS	Weight	Credit				
Leading teacher         Ewert-Krzemieniewski Stanisław (Stanisław.Ewert-Krzemieniewski@zut.edu.pl)           Other teachers         Ewert-Krzemieniewski Stanisław (Stanisław.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           Course content divided into various forms of instruction         Number of hours           Course content divided into various forms of instruction         Number of hours           Course content divided into various forms of instruction         Number of hours           Course content divided into various forms of instruction         Number of hours           Course content divided into various forms of instruction         Number of hours           Course content divided into various forms of instruction         Number of hours           T-W-1         1) Introduction to functions of more than one variable and partial differentiation.         2) Vector differentiations           T-W-1         1	lecture		W	2	30	4,0	0,50	examination				
Other teachers         Ewert-Krzemieniewski Stanisław (Stanisław.Ewert-Krzemieniewski@zut.edu.pl)           Prerequisites           W-1         Student knows the basics of high school mathematics.           C-1         Consolidation of knowledge related to mathematics.           C-2         Developing student's ability to solve mathematical problems.         Very C-2           C-3         Improving student's awareness of the need for continuous education and professional development.           CONTENT A           C.1         Introduction to functions of more than one variable and partial differentiation.         Number of hours           CONTENT A         Number of hours           C.2         Vector differential calculus.         Number of hours           A line approximation.         Number of hours           T-W-1         11 Complex numbers.         30           12 Algebra of matrices.         30           31 Systems of linear equations.         41 Vectors in n-dimensional space, dot product.         51 Corses product.           13 Complex numbers.         30 Initial mean diagnostic products in a 3-dimensional space.         30 Systems of linear equations.           4-V-2.1         18 Sic curves and surfaces in a 3-dimensional space.         80 Eigenvalues and eigenvectors.           7-A-1         Solving tasks in the field of kno	lecturing	course	Α	2	30	2,0	0,50	credits				
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    CONTENT	Leading t	eacher	Ewert	-Krzemieniewsk	ci Stanisław (Stani	slaw.Ewert-Krzemier	niewski@zut.edu	ı.pl)				
Module/course unit objectives         C-1	Other tea	chers	Ewert	-Krzemieniewsk	ci Stanisław (Stani	slaw.Ewert-Krzemier	niewski@zut.edu	ı.pl)				
Module/course unit objectives         C-1												
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    CONTENT   A:			basics	of high school ma	thematics.							
C-1 Consolidation of knowledge related to mathematics.  C-2 Developing student's ability to solve mathematical problems.  Course content divided into various forms of instruction    CONTENT   A:	Module/co											
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    CONTENT												
Improving student's awareness of the need for continuous education and professional development.   Course content divided into various forms of instruction   Number of hours												
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: T-W-1 1) Complex numbers. 2) Algebra of matrices. 3) Systems of linear equations. 4) Vectors in n-dimensional space, dot 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  Student workload - forms of activity Number of hours A-W-1 Participation in lectures 30  A-W-2 Self-study of the literature 4A-W-3 Written and oral exam 4A-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)		· · ·				ation and professional	development.					
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: T-W-1 1) Complex numbers. 2) Algebra of matrices. 3) Systems of linear equations. 4) Vectors in n-dimensional space, dot 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  Student workload - forms of activity Number of hours A-W-1 Participation in lectures 30  A-W-2 Self-study of the literature 4A-W-3 Written and oral exam 4A-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)	Course co	ontent divided into	variou	us forms of instr	uction	<u> </u>	-	Number of hours				
T-A-1 Solving tasks in the field of knowledge presented at lectures.  Student workload - forms of activity  A-W-1 Participation in lectures  A-W-2 Self-study of the literature  86  A-W-3 Written and oral exam  4-A-1 Participation in classes  A-A-2 Self-study of the literature  26  A-A-3 Consultations  Teaching methods / tools  M-1 Lecture  M-2 Classes  Evaluation methods (F - progressive, P - final)	T-W-1	A: 1) Introduction to f 2) Vector differenti 3) Vector integral of 4) Series and appro B: 1) Complex numbe 2) Algebra of matri 3) Systems of linea 4) Vectors in n-dim 5) Cross product. 6) A line and a plar 7) Basic curves and	30									
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)	T-A-1	<u> </u>										
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)	Student w	vorkload - forms of	activii	tv				Number of hours				
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)	A-W-1											
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)	A-W-2	· ·	86									
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)	A-W-3	Written and oral ex	4									
A-A-3 Consultations 4  Teaching methods / tools  M-1 Lecture  M-2 Classes  Evaluation methods (F - progressive, P - final)	A-A-1	Participation in class	30									
Teaching methods / tools  M-1 Lecture  M-2 Classes  Evaluation methods (F - progressive, P - final)	A-A-2	,	26									
M-1 Lecture M-2 Classes  Evaluation methods (F - progressive, P - final)	A-A-3	Consultations						4				
M-2 Classes  Evaluation methods (F - progressive, P - final)	Teaching	methods / tools										
Evaluation methods (F - progressive, P - final)	M-1	Lecture										
	M-2	Classes										
S-1 P Lecture - written exam	Evaluation	n methods (F - pro	gressiv	/e, P - final)								
	S-1	P Lecture - w	ritten e	xam								

Evaluation	meth	ods (F - progressive, P - final)										
S-2	Р	Lecture - oral exam										
S-3	F	Classes - written tests										
	Desig	ned 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	9		1	•	•		-		·I			
ChEn_1A_B01b_W01 LEARNING OUTCOMES							T-W-1					
able to: 1. Demons university lev study. 2. Demons areas of calcu	trate cor el mathe trate ma ilus, fund trate imp	pletion of the course students shoul be mpetence to study further technical ematics as required in their program of athematical knowledge and skills in the ctions, vectors and complex numbers. proved analytical ability, in particular their ng.	ChEn_1A_W01	P6S_WG_TA11	P6S_WG_IA11	C-1		M-1	S-1 S-2			
Skills				•	•	1	•	•				
	ChEn_1A_B01b_U01 Student can use the acquired knowledge to solve mathematical problems.			P6S_UU P6S_UW_TA11 P6S_UW_TA12	P6S_UW_IA12	C-2	T-A-1	M-2	S-3			
Other soci	al / pe	rsonal competences										
	are of th	ne need for continuous education and nent 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 i	eading	7										
1. Jeffrey, A	lan, Ad	vanced Engineering Mathematics, Har	cour/Academic F	Press, any edit	tion							
Suppleme	ntary r	reading										
1. Glyn, Jan	nes, Adv	vanced modern engineering mathema	tics, Prentice Ha	II, 2011								
2. Croft, To	าy, Mat	hematics for engineers, Pearson Prent	ice Hall, 2015									