2 Skills Student is able to meet the challenges arising from the high school Sciel Student understands the peed and knows the peedbility of studying (peetgraduate sources)		f the module/subject		Co	
Control Engineering and Robotics (general academic, practical) (brak) 1 / 1 Elective path/specialty Subject offered in: polish Course (compulsory, electiv obligatory Cycle of study: First-cycle studies Full-time No. of readis No. of hours full-time No. of credits Lecture: 4 Classes: 2 Laboratory: Project/seminars: No. of credits Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) Education areas and fields of science and art ECTS distribution (number and %) 8 100% Responsible for subject / lecturer: dr Wieslawa Nowakowska email: wieslawa.nowakowska@put.poznan.pl tei. 616652200 8 100% Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: 1 Kowledge Killy engilasions of differential and integral calculus of functions of single va	Math	nematics I		10	10331111010342117
Elective path/specialty Course (computatory, elective obligatory) Cycle of study; Form of study (full-time,part-time) First-cycle studies full-time No. of hours 2 Lecture: 4 Classes: 2 Laboratory: Project/seminars: Project/seminars: 8 Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) (brak) Education areas and fields of solence and att ECTS distribution (number and 's) technical sciences 8 Responsible for subject / lecturer: dr Wieslawa Nowakowska @put.poznan.pl dr Wieslawa Nowakowska @put.poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 2 Skills Student is able to meet the challenges arising from the high school 3 Social competencies Study outcomes and reference to the educational results for a field of study Knowledge: 1. 1. Knowledge: 3. Social competencies of multiple and line integrals. Study outcomes and reference to			and Dahatian	(general academic, practical)	
- polish obligatory Cycle of study; Form of study (full-time,part-time) Form of study (full-time,part-time) First-cycle studies full-time No. of oredits No. of hours Classes; 2 Laboratory: - Project/seminars: - No. of oredits Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) 8 Education areas and fields of science and at Education areas and accide a			and Robotics	· · · ·	
First-cycle studies full-time No. of realits No. of credits Lecture: 4 Classes: 2 Laboratory: - Project/seminars: - 8 Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) Education areas and fields of science and art (brak) (brak) ECTS distribution (number and %) technical sciences 8 100% 8 100% Responsible for subject / lecturer: dr Wiestawa Nowakowska email: wiestawa.nowakowska@put.poznan.pl 8 100% Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge Basic knowledge with range of secondary school. 1 2 Skills Student is able to meet the challenges arising from the high school 3 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply a	Elective	e path/specialty	-		
No. of hours No. of credits Lecture: 4 Classes: 2 Laboratory: Project/seminars: - 8 Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) Education areas and fields of science and at (brak) (brak) Education areas and fields of science and at Editation (number and %) 8 100% Responsible for subject / lecturer: dr Wieslawa Nowakowska @put.poznan.pl 8 100% Vydzia Elektryczny ul. Piotrowo 3A 60-965 Poznań 8 100% Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge Basic knowledge with range of secondary school. 2 Skills Student is able to meet the challenges arising from the high school 3 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiple integrals. Study outcomes and reference to the educational results for a field of study	Cycle o	f study:		Form of study (full-time,part-time)	
Lecture: 4 Classes: 2 Laboratory: - Project/seminars: - 8 Status of the course in the study program (Basic, major, other) (brak) (university-wide, from another field) (brak) Education areas and fields of science and art (brak) (brak) add %) Education areas and fields of science and art (brak) (brak) add %) Education areas and fields of science and art (brak) (brak) add %) Education areas and fields of science and art (brak) (brak) add %) Education areas and fields of science and art (brak) (brak) (brak) technical sciences 8 100% 8 100% Responsible for subject / lecturer: (critic science) 8 100% Visities and nowakowska @put.poznan.pl tel. 616652320 Wydzia Elektryczny (u. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. 3 Social competencies Student understands the need and knows the possibi		First-cyc	cle studies	full-tim	e
Status of the course in the study program (Basic, major, other) (university-wide, from another field) (brak) (brak) Education areas and fields of science and at ECTS distribution (number and %) technical sciences 8 100% Responsible for subject / lecturer: at dr Wieslawa Nowakowska @put.poznan.pl enail: wieslawa.nowakowska @put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 8 Student is able to meet the challenges arising from the high school 2 Skills 3 Social competencies The recoprizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] 3. To calculate t	No. of h	nours			No. of credits
Knowledge Basic knowledge with range of secondary school 1 Knowledge Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recoprizing methods and applications of differential and integral calculus of functions of single variable. The getting to Knowledge: 1. To recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals. Studies: To understand the derivatives, to be able calculate extrema for functions of single variable. The getting to Knowledge: 1. To understand the concept of multiple integrals, no and the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals, no advage of calculation and applications - [K_W01+++] 3. To comprehend the concept of multiple integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] 3. To comprehend the concept of multiple integrals, measures of areas, the length of curves, volumes and surface areas of solid of	Lectu	re: 4 Classes	s: 2 Laboratory: -	Project/seminars:	8
Education areas and fields of science and art ECTS distribution (number and %) technical sciences 8 100% Responsible for subject / lecturer: dr Wieslawa Nowakowska dr Wieslawa.nowakowska@put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 2 Skills 3 Student is able to meet the challenges arising from the high school 3 Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] 3. To caclulate indefinite and definite integrals, m	Status (of the course in the study	program (Basic, major, other)	(university-wide, from another field)	1
technical sciences 8 100% Responsible for subject / lecturer: dr Wiesława Nowakowska email: wiesława.nowakowska@put.poznan.pl tel. 616652320 1 1 1 6 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań 2 Skills 3 1			(brak)	(br	ak)
Responsible for subject / lecturer: dr Wiesława.nowakowska @put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 2 Skills 3 Sudent is able to meet the challenges arising from the high school 3 Social competencies Second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] 3. To calculate the derivative, Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 3. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid for evolution [K_U01+K_U05+]	Educati	on areas and fields of sci	ence and art		
dr Wiesława Nowakowska email: wiesława.nowakowska @put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 2 Skills 3 Social competencies 3 Social competencies Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] Stores 1. To calculate the derivative, ind monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate the derivative, Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To cal	techr	nical sciences			8 100%
dr Wiesława Nowakowska email: wiesława.nowakowska @put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań Prerequisites in terms of knowledge, skills and social competencies: 1 Knowledge 2 Skills 3 Social competencies 3 Social competencies Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] Stores 1. To calculate the derivative, ind monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate the derivative, Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To cal	Resp	onsible for subj	ect / lecturer:		1
Knowledge Basic knowledge with range of secondary school. 2 Skills Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid revolution [K_U01+K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+]	ema tel. Wyd	ail: wieslawa.nowakow 616652320 dział Elektryczny	/ska@put.poznan.pl		
2 Skills Student is able to meet the challenges arising from the high school 3 Social competencies Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate partial derivatives, extrema for functions of single variable - [K_U01+K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] 3. To calculate multiple and line integrals - [K_U01+K_U05+]				d capiel competencies	
2 Skills 3 Social competencies 3 Social competencies Substrain Study outcomes and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] 4. To calculate multiple and line integrals - [K_U01+K_U05+]	Prere	equisites in term	ns of knowledge, skills an	-	
S Second-degree studies), improving language skills, professional, personal and social skills. Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] 4. To calculate multiple and line integrals - [K_U01+K_U05+]		equisites in term	ns of knowledge, skills an	-	
Assumptions and objectives of the course: The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere	equisites in term Knowledge	Basic knowledge, skills an	secondary school.	
know applications of multiply and line integrals. Study outcomes and reference to the educational results for a field of study Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere 1 2	equisites in term Knowledge Skills Social	Basic knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a	secondary school. Ilenges arising from the high school and knows the possibility of studying	g (postgraduate courses,
Knowledge: 1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere 1 2 3	equisites in term Knowledge Skills Social competencies	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv	secondary school. Ilenges arising from the high school and knows the possibility of studying	g (postgraduate courses,
 To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K_W01+++] To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Stells: To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] To calculate multiple and line integrals - [K_U01+K_U05+] 	Prere 1 2 3 Assu The re	equisites in term Knowledge Skills Social competencies Imptions and obj	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv jectives of the course: In applications of differential and in	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p	g (postgraduate courses, ersonal and social skills.
 2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K_W01+++] 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+] 	Prere 1 2 3 Assu The re know	equisites in term Knowledge Skills Social competencies imptions and obj cognizing methods an applications of multipl Study outco	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv ectives of the course: Ind applications of differential and in y and line integrals.	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p	g (postgraduate courses, ersonal and social skills. le variable. The getting to
 3. To comprehend the concept of multiple integrals and know methods of calculation and applications - [K_W01+++] Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+] 	Prere 1 2 3 Assu The re know	equisites in term Knowledge Skills Social competencies imptions and obj cognizing methods an applications of multipl Study outco	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv ectives of the course: Ind applications of differential and in y and line integrals.	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p	g (postgraduate courses, ersonal and social skills. le variable. The getting to
Skills: 1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] 2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere 1 2 3 Assu The re know Know	Aquisites in term Knowledge Skills Social competencies mptions and obj cognizing methods an applications of multiply Study outco vledge: understand the concept	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improve ectives of the course: ad applications of differential and in y and line integrals.	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f	g (postgraduate courses, bersonal and social skills. le variable. The getting to field of study applications - [K_W01+++]
 To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K_U01+K_U05+] To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+K_U05+] To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+K_U05+] To calculate multiple and line integrals - [K_U01+K_U05+] 	Prere 1 2 3 Assu The re know Know 1. To u 2. To r	equisites in term Knowledge Skills Social competencies mptions and obj cognizing methods an applications of multipl Study outco vledge: understand the concep- nean the idea of partia	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv jectives of the course: ad applications of differential and in y and line integrals. Immes and reference to the pat of limit of the sequence, diverge al derivatives, to be able calculate	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab	g (postgraduate courses, personal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++]
 To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solid of revolution [K_U01+ K_U05+] To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] To calculate multiple and line integrals - [K_U01+ K_U05+] 	Prere 1 2 3 Assu The re know 1. To u 2. To r 3. To c	equisites in term Knowledge Skills Social competencies mptions and obj cognizing methods an applications of multipl Study outco vledge: understand the concep- nean the idea of partia comprehend the concep-	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv jectives of the course: ad applications of differential and in y and line integrals. Immes and reference to the pat of limit of the sequence, diverge al derivatives, to be able calculate	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab	g (postgraduate courses, personal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++]
of revolution [K_U01+ K_U05+] 3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere 1 2 3 Assu The re know 1. To u 2. To r 3. To c Skills	equisites in term Knowledge Skills Social competencies imptions and obj cognizing methods an applications of multiple Study outco vledge: understand the concept nean the idea of partial comprehend the concept s:	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv jectives of the course: ad applications of differential and in y and line integrals. The sequence, diverge al derivatives, to be able calculate ept of multiple integrals and know	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab methods of calculation and applicat	g (postgraduate courses, ersonal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++] tions - [K_W01+++]
[K_U01+ K_U05+] 4. To calculate multiple and line integrals - [K_U01+ K_U05+]	Prere 1 2 3 Assu The re know 1. To u 2. To r 3. To u 5 kills 1. To u	equisites in term Knowledge Skills Social competencies imptions and obj cognizing methods an applications of multiply Study outco vledge: understand the concept nean the idea of partial comprehend the concept sealculate the derivative	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improve ectives of the course: and applications of differential and in y and line integrals. The sequence, diverge al derivatives, to be able calculate ept of multiple integrals and know a. Find monotonicity, maxima, min	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab methods of calculation and applicat	g (postgraduate courses, ersonal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++] tions - [K_W01+++]
	Prere 1 2 3 Assu The re know 1. To u 2. To u 3. To u 3. To u 3. To u 2. To u 2. To u 2. To u	equisites in term Knowledge Skills Social competencies imptions and obj cognizing methods an applications of multiply Study outco vledge: understand the concept nean the idea of partial comprehend the concept scalculate the derivative calculate indefinite and	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improv pectives of the course: Ind applications of differential and in y and line integrals. In the sequence, diverge al derivatives, to be able calculate ept of multiple integrals and know a. Find monotonicity, maxima, min d definite integrals, measures of a	secondary school. Ilenges arising from the high school and knows the possibility of studying ving language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab methods of calculation and applicat	g (postgraduate courses, ersonal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++] tions - [K_W01+++]
Social competencies:	Prere 1 2 3 Assu The re know Know Know Know 1. To u 2. To u 3. To u 2. To u 3. To u 3. To u (K_U0)	equisites in term Knowledge Skills Social competencies mptions and obj cognizing methods an applications of multiply Study outco vledge: understand the concept nean the idea of partial comprehend the concept scalculate the derivative calculate indefinite an- obution [K_U01+ K_L calculate partial deriva 1+ K_U05+]	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improve iectives of the course: ad applications of differential and in y and line integrals. Integrals. Integrals and reference to the ad derivatives, to be able calculate expt of multiple integrals and know e. Find monotonicity, maxima, min d definite integrals, measures of a U05+] tives, extrema for functions of two	secondary school. Ilenges arising from the high school and knows the possibility of studying ing language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab methods of calculation and applicat ima of functions of single variable areas, the length of curves, volumes o variables, to calculate divergence	g (postgraduate courses, ersonal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++] tions - [K_W01+++] - [K_U01+K_U05+] s and surface areas of solid
	Prere 1 2 3 Assu The re know 1. To u 2. To u 3. To u 2. To u 3. To u 2. To u 3. To u 2. To u 3. To u 3. To u 3. To u 3. To u 4. To u 4. To u 4. To u 4. To u 5. To u 5. To u 6. To u 1. To u 1. To u 2. To u 3. To u 3. To u 1. To u 2. To u 3. To u 3. To u 3. To u 4. To u 5. To u 4. To u 5. To u 5. To u 4. To u 4. To u 4. To u 4. To u 4. To u 4. To u 5. To u 5. To u 4.	equisites in term Knowledge Skills Social competencies mptions and obj cognizing methods an applications of multiply Study outco vledge: understand the concept nean the idea of partial comprehend the concept scalculate the derivative calculate indefinite an- obution [K_U01+ K_L calculate partial deriva 1+ K_U05+]	As of knowledge, skills an Basic knowledge with range of s Student is able to meet the chal Student understands the need a second-degree studies), improve iectives of the course: ad applications of differential and in y and line integrals. Integrals. Integrals and reference to the ad derivatives, to be able calculate expt of multiple integrals and know e. Find monotonicity, maxima, min d definite integrals, measures of a U05+] tives, extrema for functions of two	secondary school. Ilenges arising from the high school and knows the possibility of studying ing language skills, professional, p ntegral calculus of functions of sing e educational results for a f ence of the series, derivative and it a extrema for functions of two variab methods of calculation and applicat ima of functions of single variable areas, the length of curves, volumes o variables, to calculate divergence	g (postgraduate courses, ersonal and social skills. le variable. The getting to field of study applications - [K_W01+++] les - [K_W01+++] tions - [K_W01+++] - [K_U01+K_U05+] s and surface areas of solid

Assessment methods of study outcomes

Lectures: written exam checking theoretic knowledge and ability it application in practical exercises. Classes: tests during the semester and colloquium

Course description Differential and integral calculus of functions of single variable. Applications of integrals. Differential calculus of functions of several variables. Multiply integrals and their applications. Line integrals. Infinite series and power series. Basic bibliography: 1. G. Decewicz, W. Żakowski, Matematyka, t. I, WNT, Warszawa, 2003. 2. W. Żakowski, M. Kołodziej, Matematyka, t. II, WNT, Warszawa, 1994. 3. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka, cz. I, II, III, Wyd. Politechniki Poznańskiej, Poznań, 2001. 4. F. Leja, Rachunek różniczkowy i całkowy, PWN, Warszawa, 1978. Additional bibliography: 1. Krysicki W., Włodarski L.: Analiza matematyczna w zadaniach. Część I, II, PWN, Warszawa, 2006. 2. Stankiewicz W.: Zadania z matematyki dla wyższych uczelni technicznych. Część I, II, PWN, Warszawa, 2006. 3. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 i 2, Oficyna Wyd. GiS, Wrocław, 2006. Result of average student's workload Time (working Activity hours) 60 1. Lectures 2. Classes 30 3. Consultations and exam 7 60 4. Preparation for classes 5. Preparation for exam 33 Student's workload Source of workload ECTS hours 8 Total workload 190 Contact hours 97 4 0 0 Practical activities