



RATING-LIST OF THE “MATERIAL CUTTING AND CUTTING TOOLS” DISCIPLINE

MARKS			RATING-LIST of the discipline “Material Cutting and Cutting Tools” for students of educational program 150700 “Mechanical Engineering”		6th	7th	8th	Total
«Excellent»	A+	96 – 100 points		<p>6, 7 and 8 semesters Lecturers: Kirsanov S.V., Kozlov V.N., Kim A. B.</p>	Lectures	18	18	9
	A	90 – 95 points	Practical classes		10	17	15	42 hours
«Good»	B+	80 – 89 points	Laboratory works		8	19		27 hours
	B	70 – 79 points	Class hours in total		36	54	24	114 hours
«Fair»	C+	65 – 69 points	Self-study training		32	54	10	96 hours
	C	55 – 64 points	TOTAL		68	108	34	210 hours
Pass	D	Equal or more than 55 points			2	4	3	9 credits
Fail	F	55 points and less	Final assessment form		Test	Examination	Differential test	

Results of studying the subject:

R.4	Ability to plan and carry out analytical and experimental research in the field of engineering, using the latest science and technology
R.5	Ability to show knowledge of the legal, social, environmental and cultural aspects of complex engineering activities, knowledge about health care, life safety, and labor in engineering
R.6	Communicate in a professional environment and in society in whole, including foreign language; analyze existing and develop new technical documentation, clearly state and defend the results of complex engineering activities in engineering plants and in industrial research organizations
R.11	Ability to give preliminary feasibility of design solutions, perform organizational and planning calculations for the establishment or reorganization of production sites, to plan the work of staff and payroll, to apply advanced methods of use of technological equipment in the manufacture of engineering products
R.13	Readiness to make technical documentation (schedules, instructions, budgets, plans, orders for supplies and equipment); to perform work on standardization, technical preparation for certification of equipment, systems, processes and materials; to organize metrological support for the manufacturing processes; to prepare documentation for a quality management system in enterprise

Assessment form	6 th semester		7 th semester		8 th semester	
	Quantity	Points	Quantity	Points	Quantity	Points
Essay						
Report	2	4	2	4	2	4
Laboratory work report	12	24	9	18		
Practice report			9	9	7	14
Written test	3	21	4	26	2	20
Homework defending	1	11	1	3	1	22
Total		60		60		60



6th semester

Week	Monday date	Results of studying	Studying activity category	Hours		Assessment materials						Points	Teaching method (ДОТ)*	Academic means					
				Class	Self-study	Essay	Report	Laboratory work report	Test							Academic literature	Internet Resources	Video Resources	
1-8			Part 1. Basics of Cutting (8 hours)																
1		P2, P3, P4	Lecture 1. Kinematics of cutting and geometry of a cutting edge. Cutting tool materials	2															OCH1, 2 ДОП 1, 2
			Self-study		2														ДОП 2
2		P2, P3, P4	Laboratory work 1. Cutting tool geometry measurement	2				2				2							OCH 2
			Self-study		2														OCH 1
3		P2, P3, P4	Lecture 2. Processes of the cutting zone	2															OCH 1, 2 ДОП1, 2, 3
			Self-study		2														OCH 1
4		P2, P3, P4, P6	Practice 1. Analysis of the cutting zone	2				2				2							OCH 2
			Self-study		2														OCH 1
5		P2, P6, P13	Lecture 3. Forces and heat processes in cutting	2															OCH1, 2, 3 ДОП 4
			Self-study		2														OCH 1
6		P2, P6, P11, P13	Laboratory work 2. Influence of the cutting parameters on cutting force and temperature	2				2				2							OCH 2
			Self-study		2														OCH 1
7		P5, P6, P11, P13	Lecture 4. Wear and cutting tool life	2															OCH 1, 2
			Self-study		2														ДОП 4
8		P2, P6, P11, P13	Laboratory work №3. Wear and tool life in turning operations	2				2				2							OCH 2 ДОП 4
			Self-study		2														OCH 1
			Test 1									10							10
			Totals on Part 1	18	18			8	10			18							



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				Class	Self-study	Essay	Report	Laboratory work report	Test							Academic literature	Internet Resources	Video Resources
9-14			Part 2. Basic Types of Machining (6 hours)															
9		P5, P6, P11, P13	Conference-week 1															
			Lecture 5. Turning operations, calculation of cutting parameters and cutting power	2													OCH 2, 3	
			Conference				2					2					OCH 2	
			Test assignments (ЦОКО)															
			Self-study		2												OCH 2, 3	
			Totals on check point 1	20	20		2	8	10			20						
10		P4, P5, P6, P11, P13	Practice 2. Calculation of cutting parameters and cutting power in turning operations	2				2				2					OCH 2, 3	
			Self-study		2												ДОП 1	
																	OCH 2, 3	
11		P4, P5, P6, P11, P13	Lecture 6. Hole machining operations	2													OCH 1	
			Self-study		2												OCH 2, 3	
12		P4, P5, P6, P11, P13	Practice 3. Calculation of the cutting parameters and required power in drilling, core-drilling and reaming	2				2				2					OCH 1, 3	
			Self-study		2												ДОП 4	
																	OCH 1, 3	
																	ДОП 1	
13		P5, P6, P11, P13	Lecture 7. Milling operations	2													OCH 1	
			Self-study		2												OCH 2, 3	
14		P5, P6, P11, P13	Practice 4. Calculation of the cutting parameters and required power in milling of slots and shoulders	2				2				2					OCH 1, 3	
			Self-study		2												ДОП 1, 4	
			Test 2						10			10					ДОП 1	
			Totals on Part 2	18	18			8	10			18						



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				Class	Self-study	Essay	Report	Laboratory work report	Test							Academic literature	Internet Resources	Video Resources
15-18			Part 3. Grinding operations (4 hours)															
15		P4, P5, P6, P11, P13	Lecture 8. Abrasives	2													OCH 1	
			Self-study		2												OCH 1, 3	
16		P4, P5, P6, P11, P13	Practice 5. Calculation of the cutting parameters and required power in grinding and milling of flats	2				2					2				OCH 1, 3	
			Self-study		2												ДОП 1, 4	
																	ДОП 1	
17		P4, P5, P6, P11, P13	Lecture 9. Grinding wheels codification	2													OCH 1	
			Self-study		2												ДОП 1	
18		P4, P5, P6, P11, P13	Conference-week 2															
			Laboratory work 4. Influence of the cutting parameters on cutting force in grinding and milling	2				2					2				OCH 2	
			Conference					2					2				ДОП 4	
			Test assignments (ЦОКО)														OCH 2	
			Self-study		2													
			Pre-exam Consultation															
			Test 3										7					
			Totals on Part 3	8	8			2	4	7			13					
			Home assignments										10					
			Totals on check point 2	36	36			4	24	26	10		60					
			Examination test										40					
			Course hours in 6th semester in total	36	36								100					

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7th semester

Week	Monday date	Results of studying	Studying activity category	Hours		Assessment materials						Points	Teaching method (ДОТ)*	Academic means				
				Class	Self-study	Essay	Report	Laboratory work report	Test	Home assignment	Academic literature			Internet Resources	Video Resources			
1-4			Part 1. Design and Calculation of Broaches and Cutters (4 hours)															
1		P4, P13	Lecture 1. Design and calculation of cutters	2													OCH1, 2	
			Practice 1. Calculation of thread cutters	2				2				2					OCH 2	
			Self-study		4												OCH 1	
2		P4, P13	Laboratory work 1. Sharpening of turning cutters	2				2				2					OCH 2	
			Self-study		2												OCH 1	
3		P4, P13	Lecture 2. Design and calculation of broaches	2													OCH 1, 2	
			Practice 2. Calculation of form cutters	2				2				2					OCH 2	
			Self-study		4												OCH 1	
4		P4, P13	Laboratory work 2. Sharpening of form cutters	2				2				2					OCH 2	
			Self-study		2												OCH 1, 2	
			Test 1						7			7						
			Totals on Part 1	12	12			8	7			15						
5-8			Part 2. Design and Calculation of Drills, Core-Drills and Reamers (4 hours)															
5		P4, P13	Lecture 3. Design and calculation of drills	2													OCH1, 2	
			Practice 3. Calculation of twist drills	2				2				2					OCH 2	
			Self-study		4												OCH 1	
6		P4, P13	Laboratory work 3. Sharpening of twist drills	2				2				2					OCH 2	
			Self-study		2												OCH 1	
7		P4, P13	Lecture 4. Design and calculation of core-drills	2													OCH 1, 2	
			Practice 4. Calculation of core-drills and reamers	2				2				2					OCH 2	
			Self-study		4												ДОП 4	
8		P4, P13	Laboratory work 4. Sharpening of core-drills and reamers	2				2				2					OCH 2	
			Self-study		2												OCH 1	
			Test 2						7			7						
			Totals on Part 2	12	12			8	2			15						



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Week	Monday date	Results of studying	Studying activity category	Hours		Assessment materials						Points	Teaching method (ДОТ)*	Academic means				
				Class	Self-study	Essay	Report	Laboratory work report	Test	Home assignment	Academic literature			Internet Resources	Video Resources			
9-14			Part 3. Design and Calculation of Milling cutters (6 hours)															
9			Conference-week 1															
		P4, P13	Lecture 5. Design and calculation of plain and disc cutters	2												OCH 2, 3		
			Practice 5. Calculation of plain milling cutter	2				2				2				OCH 2		
			Conference					2				2				OCH 2		
			Test assignments (ЦОКО)															
			Self-study		4											OCH 2, 3		
			Totals on check point 1	24	24			2	16	14		32						
10		P4, P13	Laboratory work №5. Sharpening of plain milling cutters	2				2				2				OCH 2, 3		
			Self-study		2											OCH 2, 3		
11		P4, P13	Lecture 6. Design and calculation of end mills	2												OCH 1		
			Practice 6. Calculation of end mills	2				2				2				OCH 1, 3		
			Self-study		4													
12		P4, P13	Laboratory work 6. Sharpening of end mills	2				2				2				OCH 1, 3		
			Self-study		2											OCH 1, 3		
13		P4, P13	Lecture 7. Design and calculation of special milling cutters	2												OCH 1		
			Practice 7. Calculation of special milling cutters	2				2				2				OCH 1, 3		
			Self-study		4											OCH 2, 3		
14		P4, P13	Laboratory work 7. Sharpening of special milling cutters	2				2				2				OCH 1, 3		
			Self-study		2											OCH 1, 3		
			Test 3							7		7						
			Totals on Part 3	18	18			12	7			19						



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Week	Monday date	Results of studying	Studying activity category	Hours		Assessment materials						Points	Teaching method (ДОТ)*	Academic means			
				Class	Self-study	Essay	Report	Laboratory work report	Test	Home assignment	Academic literature			Internet Resources	Video Resources		
15-18			Part 4. Design and Calculation of Thread Cutting Tools (4 hours)														
15		P4, P13	Lecture 8. Design and calculation of thread cutter and chaser	2													OCH 1
			Practice 8. Calculation of thread cutter	2				2									OCH 1, 3
			Self-study		4												OCH 1, 3
16		P4, P13	Laboratory work 7. Sharpening of thread cutter	2				2									OCH 1, 3
			Self-study		2												OCH 1, 3
17		P4, P13	Lecture 9. Design and calculation of thread rolling tools	2													OCH 1
			Practice 9. Calculation of thread rolling head	2				2									OCH 1, 3
			Self-study		4												OCH 1, 3
18		P4, P13	Conference-week 2														
			Laboratory work 9. Sharpening of thread chasers	2				2									OCH 2 ДОП 4
			Conference					2									OCH 2
			Test assignments (ЦОКО)														
			Self-study		2												
			Pre-exam Consultation														
			Test 4						5								5
			Totals on Part 4	12	12			2	8	5							15
			Home assignments														3
			Totals on check point 2	54	54			4	24	27	14						60
			Examination														40
			Course hours in 7th semester in total	54	54			4									100

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8th semester

Week	Monday date	Results of studying	Studying activity category	Hours		Assessment materials						Points	Teaching method (ДОТ)*	Academic means				
				Class	Self-study	Essay	Report	Laboratory work report	Test							Academic literature	Internet Resources	Video Resources
1-6			Part 1. Design and Calculation of Gear Cutting Tools (6 hours)															
1		P4, P13	Lecture 1. Design and calculation of involute gear cutters	2													OCH1, 2	
			Self-study		2												OCH1	
2		P4, P13	Practice 1. Calculation of round form cutters	2				2				2					OCH2, 3	
			Self-study		2												OCH 1	
3		P4, P13	Lecture 2. Design and calculation of gear shaping heads	2													OCH 1, 2	
			Self-study		2												ДОП1, 2, 3	
4		P4, P13	Practice 2. Calculation of prismatic form cutters	2				2				2					OCH 2	
			Self-study		2												OCH 1	
5		P11, P13	Lecture 3. Design and calculation of hobbing cutters	2													OCH1, 2	
			Self-study		2												OCH 1	
6		P11, P13	Practice 3. Calculation of hobbing cutters	2				2				2					OCH 2	
			Self-study		2												OCH 1	
			Test 1							10		10						
			Totals on Part 1	12	12			6	10			16						
7-12			Part 2. Cutting Tools for Automated Production (3 hours)															
7		P11, P13	Lecture 4. Cutting tools for automated production	2													OCH1, 2	
			Self-study		2												OCH1, 2	
8		P11, P13	Practice 4. Design of cutting tools for CNC machines	2				2				2					OCH 2	
			Self-study		2												OCH1	
9			Conference-week 1															
		P11, P13	Lecture 5. Auxiliary tools for CNC machines and cells	1													OCH 2, 3	
			Conference					2				2					OCH 2	
			Test assignments (ЦОКО)															
			Self-study		1												OCH 2, 3	
			Totals on check point 1	17	17			2	8	10		20						



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				Class	Self-study	Essay	Report	Laboratory work report	Test							Academic literature	Internet Resources	Video Resources	
10		P11, P13	Practice 5. Design of tools for automated lines	2				2					2		OCH 2				
			Self-study		2											OCH 2, 3			
11		P11, P13	Practice 6. Design of tools for automated lines	2											OCH 2				
			Self-study		2														
12		P11, P13	Conference-week 2																
			Practice 7. Design of auxiliary tools for CNC machines	2				2						2		OCH 1, 3 ДОП 1, 4			
			Conference					2						2		OCH 2			
			Test assignments (ЦОКО)																
			Self-study		2									1					
			Pre-exam Consultation																
			Test 2									10			10				
Totals on Part 2				12	12		2	8	10			18							
Home assignments											22	22							
			Totals on check point 2	24	24		2	16	20	22		60							
			Differential test									40							
			Course hours in 8th semester in total	24	24							100							

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Academic means:

№ (code)	Basic literature (ОСН)
ОСН 1	Кожевников Д.В., Схиртладзе А.Г., Кирсанов С.В. Резание материалов. – М.: Машиностроение, 2007. –304 с.
ОСН 2	Кожевников Д.В., Кирсанов С.В. Металлорежущие инструменты: Учебник. –Томск: Изд-во Том.ун-та, 2003. –392 с.
ОСН 3	Справочник технолога-машиностроителя. В 2-х томах, т.2. Под ред. Косиловой А.Г. и Мещерякова Р.К. – М.: Машиностроение, 1985. 496 с.,и

№ (code)	Auxiliary literature (ДОП)
ИР 1	Грановский Г.И., Грановский Э.Г. Резание металлов. –М.:Высшая школа, 1985. –304 с.
ИР 2	Иноземцев Г.Г. Проектирование металлорежущих инструментов. М.:Машиностроение, 1984, -270 с.
ИР 3	Нефедов Н.А., Осипов К.А. Сборник задач и примеров по резанию металлов и режущему инструменту. –М.:Машиностроение, 1990. –448 с.
ИР 4	Справочник конструктора-инструментальщика/ Под ред. В.И.Баранчикова. 1994. –560 с.