



SYLLABUS OF THE DISCIPLINE «Technology of machine building»

Education and qualification level - Bachelor
Specialty 13 - «Mechanical engineering»
Year of study (course) – 2, 3, semester – 4,5,6
Form of education – on-site mode of study
Number of credits ECTS - 7
Language of study – English, Ukrainian

Lecturer of discipline
Contacts of Lecturer
(e-mail)
Web-page of discipline
eLearn

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Part 1. <http://elearn.nubip.edu.ua/course/view.php?id=1168>

Part 2. <http://elearn.nubip.edu.ua/course/view.php?id=2257>

DESCRIPTION OF THE DISCIPLINE

The discipline "Technology of machine building" contains basic information about the fundamental of technology of machine building (mechanical engineering), types of technological processes, basics of manufacturability of parts design, methods of achievement of processing accuracy and quality of surfaces, basics of technical rationing and typical technological processes of assembly of machines and the manufacture of parts of different types.

The purpose of the discipline is to provide the necessary knowledge to the future design engineer for the successful selection of technological methods for obtaining and processing workpieces for ensuring high product quality, saving materials, high productivity.

The objectives of the discipline are to study technological methods of production and processing workpieces, their characteristics, basing of workpieces, problems of parts manufacturability (taking into account obtaining methods), technological methods to improve mechanical treatment accuracy and quality of the treated surface.

Competencies of educational program:

1) *Integral competence:* The ability to solve complex specialized tasks and solve practical problems in the field of mechanical engineering using the theories and methods of modern science based on a systems approach and taking into account the complexity and uncertainty of the operating conditions of technological systems.

2) *General competencies:*

GC1. The ability to think abstractly.

GC2. Ability to apply knowledge in practical situations.

GC5. Ability to generate new ideas (creativity).

GC7. Ability to communicate in a foreign language.

GC8. The ability to act socially responsibly and consciously.

GC10. Skills in using information and communication technologies.

GC12. The ability to realize one's rights and responsibilities as a member of society, to realize the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.

GC13. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.

3) *Special (professional) competences of the specialty (SC):*

PC1. Ability to apply typical analytical methods and computer software tools for solving engineering problems of industrial mechanical engineering, effective quantitative methods of

mathematics, physics, engineering sciences, as well as appropriate computer software for solving engineering problems of industrial mechanical engineering.

PC2. The ability to apply fundamental scientific facts, concepts, theories, principles to solve professional problems and practical problems of industrial mechanical engineering.

PC4. The ability to implement engineering developments in industrial mechanical engineering, taking into account technical, organizational, legal, economic and environmental aspects throughout the life cycle of the machine: from design, construction, operation, maintenance, diagnostics and disposal.

PC7. The ability to make effective decisions regarding the selection of construction materials, equipment, processes and to combine theory and practice to solve an engineering task.

PC8. The ability to realize creative and innovative potential in project development in the field of mechanical engineering.

PC9. The ability to carry out commercial and economic activities in the field of mechanical engineering.

PC10. The ability to develop plans and projects in the field of mechanical engineering under uncertain conditions, aimed at achieving the goal, taking into account existing limitations, to solve complex problems and practical problems of improving product quality and its control.

Programmatic learning results

LR2. Knowledge and understanding of mechanics and mechanical engineering and their development prospects.

LR3. To know and understand the systems of automatic management of objects and processes of industrial engineering, to have skills in their practical use.

LR4. Carry out engineering calculations to solve complex problems and practical problems in industrial mechanical engineering.

LR7. Prepare production and operate products using automatic life cycle support systems.

LR10. To understand the problems of labor protection and legal aspects of engineering activity in industrial mechanical engineering, the skills of forecasting the social and environmental consequences of the implementation of technical tasks.

LR11. Communicate freely with the engineering community orally and in writing in national and foreign languages.

LR12. Apply means of technical control to evaluate the parameters of objects and processes in industrial mechanical engineering.

STRUCTURE OF DISCIPLINE COURSE

Theme	Hours (lectures/ Lab. works/ Self study)	Results of study	Task	Estimation, points
4 Semester				
The thematic module 1. Basics, fundamentals of machine building.				35
Theme 1. Basics, fundamentals of machine building	2/0/4	Students should: <i>know:</i> production and technological processes, warehousing, development and analysis of technological processes, fundamental factors, methods for ensuring accurate machining, statistical methods for further investigation during	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	
Theme 2. Fabricability (processability index, manufacturability, of products design	2/0/4			
Theme 3. Fundamentals of locating parts, workpieces, products	2/2/6			10

Theme 4. Accuracy of mechanical processing and methods of its providing	5/9/8	mechanical mining. <i>be able to:</i> determine the technology bases, analyze the part for the technology, determine a products waste, refused materials, defects.		20
Theme 5. Quality of surfaces of machine parts and methods of its providing	2/2/4			5
The thematic module 2. Fundamentals of technical valuation				35
Theme 1. Fundamentals of technical valuation	2/2/4	Students should: <i>know:</i> the basic methods and ways to distribute technical time norms of the technological process. <i>be able to:</i> set up, determine the norms.	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	35
Total for the 4th semester	15/15/30	-	-	70
Tests				30
Total for the 4th semester				100
5 semester				
The thematic module 3. Devices for metalworking machine tools				35
Theme 1. Devices for metalworking machine tools	10/10/10	Students should <i>know:</i> the layout for the technological process of mechanical processing details. Mechanisms of the milestone near-shore. Optimization mode. Technical and economic indicators of the technological process. <i>be able to:</i> select equipment and accessories for technological process.	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	35
The thematic module 4. Design of technological processes of mechanical processing.				35
Theme 1. Design of technological processes of mechanical processing.	8/8/8	Students should <i>know:</i> the technological documentation, the latest development of the technological process. The last machining on top of the part and the number of	Delivery of laboratory works. Execution of independent works.	5
Theme 2. Machining, processing parts of	4/4/4		Performing laboratory and	10

"SHAFTS" class, type		technological operations. <i>be able to:</i> design the technological processes of machining the details of the different classes.	independent work in "Elearn"	
Theme 3. Machining, processing parts of "Sleeves" class, type	2/2/2			5
Theme 4. Machining, processing parts of "Levers" class, type	4/4/4			10
Theme 5. Machining, processing parts of "Discs" class, type	2/2/2			5
Total for the 5th semester	30/30/30	-	-	70
Examination				30
Total for the 5th semester				100
6 semester				
The thematic module 5. Typical technological processes of manufacturing parts				35
Theme 1. Machining, processing parts of "Gears" class, type	4/4/4	Students should <i>know:</i> the technological processes of operating the working bodies of the machines, the type the technological processes of processing the details of the high class.	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	10
Theme 2. Machining, processing parts of "Body parts" class, type	4/5/4	<i>be able to:</i> design the technological processes of processing the details of the high class parts with the highest quality technology and the latest construction materials		15
Theme 3. Manufacturing of working parts of agricultural machines	2/2/4			10
Theme 4. Manufacturing of nonmetallic parts	1/0/4			
The thematic module 6. Fundamentals of technology of assembly processes				35
Theme 1. Fundamentals of technology of assembly processes	2/2/6	Students should <i>know:</i> basic understanding and designation of the technology of warehouse processes, the classification of warehouse operations, and the technology of folding.	Delivery of laboratory works. Execution of independent works.	15
Theme 2. Automatization of assembly works	1/2/4		Performing laboratory and independent work in	10
Theme 3. Painting, drying, coating of parts	1/0/4	<i>be able to:</i>		10

		classify assembling operations, technological processes of folding	"Elearn"	
Total for the 6th semester	15/15/30	-	-	70
Tests				30
Total for the 6th semester				100

GRADING POLICY

<i>Policy on the deadlines and resubmission of works</i>	A student must submit the work within the time specified by the teacher. Works that are submitted in violation of deadlines without proper reason are evaluated at a lower grade. Resubmission of modules takes place with the permission of the lecturer in case of proper reasons (for example, illness).
<i>Policy on academic ethics</i>	Write-offs during tests and exams are prohibited (including the use of mobile devices). Course papers (projects), reports must have correct literature references.
<i>Policy on attendance</i>	A student is obliged to attend classes of all kinds every day in accordance with the established schedule, not to be late, to have the appropriate appearance. For objective reasons (for example, illness, international internship) study could be realized individually (in online form in case of approval by the Dean of the Faculty).

STUDENTS GRADING SCALE

Rating of student, points	Marks accordingly National system for passing examinations, tests	
	Examinations	Tests
90-100	excellent	accepted
74-89	good	
60-73	satisfactory (passed)	
0-59	not satisfactory (not passed)	not accepted

Printed literature and Internet sources

– Main:

1. Матеріалознавство і технологія конструкційних матеріалів: підруч. для вищ. навч. закл. України / А.С. Опальчук, Є.Г. Афтандіянц, Л.Л. Роговський, О.Є. Семеновський [та ін.]. – Вид. 2-ге, перероб. і допов. – Ніжин: Лисенко М.М., 2013. – 751 с.
2. Основні поняття і принципи технології машинобудування. Методичні вказівки з дисципліни "Технологія машинобудування" для студентів спеціальності (освітня програма) 133 «Галузеве машинобудування». К, НУБіП України. Укл. Семеновський О.Є., Похиленко Г.М.
3. Технологія сільськогосподарського машинобудування: підруч. для вищ. техн. закл. України / Б. М. Гевко [та ін.]. – Вид. 2-ге, перероб. і допов. – Тернопіль : Паляниця В. А., 2015. – 418 с.– ISBN 978-617-7331-10-9.
4. Технологія машинобудування. Проектування та виробництво заготовок [Текст] : підручник для студ. машинобуд. спец. вищ. навч. закладів / Л. І. Боженко. – Львів : Світ, 1996. – 368 с. – ISBN 5-7773-0319-6.
5. Технологічні процеси отримання заготовок для сільськогосподарського машинобудування. Методичні вказівки з дисципліни "Технологія машинобудування" для студентів спеціальності (освітня програма) 133 «Галузеве машинобудування». – К., НУБіП України. Укл. Семеновський О.Є., Похиленко Г.М.

6. Технологія машинобудування. посібник для студ. машинобуд. спец. вищ. навч. закладів / Є.О. Горбатюк, М.П.Мазур та ін. – Львів: Новий Світ, 2009. – 358 с.
РОЗМІРНІ ЛАНЦЮГИ Навчально-методичний посібник. Ю.Є. Паливода, А.Є. Дячун, Ю.Б. Капаціла, І.Г. Ткаченко. - Тернопіль : Тернопільський національний технічний університет імені Івана Пулюя, 2018. – 132 с.

– **Additional:**

1. Медвідь М.В., Шабайкович В.А. Теоретичні основи технології машинобудування. За ред. проф. М.В. Медвідя. Львів: Видавниче об'єднання «Вища школа», 1976. – 299 с.
2. Боровик А.І., Лінчевський П.А., Петраков Ю. В. Технологія машинобудування. Підручник.: ЖДТУ, Житомир. – 2005, 835 с.
3. Сучасні методи аналізу технологічних процесів у машинобудуванні: Навч. посібник /В.В. Душинський. – К.: ІСДО, 1994. – 216 с.
4. Технологія обробки на верстатах з ЧПК [Текст] : навч. посіб. для студ. машинобуд. спец. вищ. техн. навч. закл. / Гевко Б. М. [та ін.] ; Терноп. нац. техн. ун-т ім. Івана Пулюя, Каф. технології машинобуд. та автомобілів. – Т. : Крок, 2014. – 131 с. : табл., рис. – Бібліогр.: с. 126-128. - 300 экз. – ISBN 978-617-692-168-4.

– **Internet sources:**

1. Технологія машинобудування. Посібник-довідник для виконання кваліфікаційних робіт. – <http://vlp.com.ua/node/3850>
2. Машинобудування України: тенденції розвитку Бібліографічний список літератури. – http://library.zntu.edu.ua/bibliograf_pokaz/mashinobud.pdf
3. Технологія машинобудування Є.О. Горбатюк, М.П. Мазур, А.С. Зенкін, В.Д. Каразей. – <http://www.tnu.in.ua/study/refs/d184/file1357975.html>
4. Нові технології виробництва ракет у КБ «Південне». – <https://www.ukrmilitary.com/2018/12/new-technology-on-kb-pivdenne.html>
5. The complete guide to machined parts. – <https://www.3erp.com/blog/the-complete-guide-to-machined-parts/>
6. Is Hybrid Manufacturing Technology the Future of Additive Manufacturing? – <https://amfg.ai/2018/07/10/hybrid-technology-the-future-of-manufacturing/>
7. Технологія машинобудування. Посібник-довідник для виконання кваліфікаційних робіт. Юрчишин І.І. та ін. – <http://www.tnu.in.ua/study/refs/d184/file1357977.html>