



SYLLABUS OF AN ACADEMIC DISCIPLINE

«Technology of machine building»

Academic degree - Bachelor's

Specialty 13 - «Mechanical engineering»

Academic programme "Sectoral mechanical engineering"

Year of study 2, 3, semester – 4,5,6

Form of study full-time

Number of ECTS credits 7

Language(s) of instruction Ukrainian, English

Lecturer of the discipline

Lecturer's contact information (e-mail)

URL of the e-learning course on the NULES e-learning portal

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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>

ACADEMIC DISCIPLINE DESCRIPTION

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, basing of workpieces, problems of parts manufacturability (taking into account obtaining methods), technological methods to improve mechanical treatment accuracy and quality.

Competences of the discipline:

Integral competence (IC): 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.

General competencies (GS):

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.

Special (professional) competences (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.

Expected Learning Outcomes (ELO):

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

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

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

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

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.

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

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

ACADEMIC DISCIPLINE STRUCTURE

Topic	Hours (lectures/laboratory, practical, seminars)	Learning outcomes	Tasks	Assessment
1 semester				
Module 1				
Topic1 Basics, fundamentals of machine building	2/0/4	To know production and technological processes, warehousing, development and analysis of technological processes, fundamental factors, methods for ensuring accurate	Delivery of laboratory works. Execution of independent works. Performing laboratory and	
Topic2 Fabricability (processability index, manufacturability, of products design	2/0/4			

Topic3 Fundamentals of locating parts, workpieces, products	2/2/6	machining, statistical methods for further investigation during mechanical mining. To be able to determine the technology bases, analyze the part for the technology, determine a products waste, refused materials, defects.	independent work in "Elearn"	10
Topic4 Accuracy of mechanical processing and methods of its providing	5/9/8			20
Topic5 Quality of surfaces of machine parts and methods of its providing	2/2/4			5
Module 2				
Topic1 Fundamentals of technical valuation	2/2/4	To know the basic methods and ways to distribute technical time norms of the technological process. To be able to set up, determine the norms.	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	35
Total for 1st semester				70
Examination				30
Total for the course				100
2 semester				
Module 3				
Topic1 Devices for metalworking machine tools	10/10/10	To know 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. To be able to select equipment and accessories for technological process.	Delivery of laboratory works. Execution of independent works. Performing laboratory and independent work in "Elearn"	35
Module 4				
Topic1 Design of technological processes of	8/8/8	To know the technological documentation, the latest development of the	Delivery of laboratory works. Execution of	5

mechanical processing.		technological process. The last machining on top of the part and the number of technological operations.	independent works.	
Topic2 Machining, processing parts of "SHAFTS" class, type	4/4/4	To be able to design the technological processes of machining the details of the different classes.	Performing laboratory and independent work in "Elearn"	10
Topic3 Machining, processing parts of "Sleeves" class, type	2/2/2			5
Topic4 Machining, processing parts of "Levers" class, type	4/4/4			10
Topic5 Machining, processing parts of "Discs" class, type	2/2/2			5
Total for 2nd semester				70
Examination				30
Total for the course				100
3 semester				
Module 5				
Topic1 Machining, processing parts of " Gears " class, type	4/4/4	To know 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
Topic2 Machining, processing parts of "Body parts" class, type	4/5/4	To be able to		15
Topic3 Manufacturing of working parts of agricultural machines	2/2/4	design the technological processes of processing the details of the high class parts with the highest quality technology and the latest construction materials		10
Topic4 Manufacturing of nonmetallic parts	1/0/4			
Module 6				
Topic1 Fundamentals of technology of	2/2/6	To know basic understanding and	Delivery of laboratory works.	15

assembly processes		designation of the technology of warehouse processes, the classification of warehouse operations, and the technology of folding.	Execution of independent works. Performing laboratory and independent work in "Elearn"	
Topic2 Automatization of assembly works	1/2/4			10
Topic3 Painting, drying, coating of parts	1/0/4	To be able to classify assembling operations, technological processes of folding		10
Total for the 3rd semester				70
Examination				30
Total for the 6th course				100

ASSESSMENT POLICY

<i>Deadlines and exam retaking policy:</i>	Works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
<i>Academic integrity policy:</i>	Cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
<i>Attendance policy:</i>	Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

SCALE FOR ASSESSING STUDENTS 'KNOWLEDGE AND SKILLS

Student's rating, points	National grading of exams and credits	
	exams	credits
90-100	excellent	pass
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	fail

RECOMMENDED SOURCES OF INFORMATION

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.С., 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.

7. 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.

8. Боровик А.І., Лінчевський П.А., Петраков Ю. В. Технологія машинобудування. Підручник.: ЖДТУ, Житомир. – 2005, 835 с.

9. Сучасні методи аналізу технологічних процесів у машинобудуванні: Навч. посібник /В.В. Душинський. – К.: ІСДО, 1994. – 216 с.

10. 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.

11. Технологія машинобудування. Посібник-довідник для виконання кваліфікаційних робіт. – <http://vlp.com.ua/node/3850>

12. Машинобудування України: тенденції розвитку Бібліографічний список літератури. – http://library.zntu.edu.ua/bibliograf_pokaz/mashinobud.pdf

13. Технологія машинобудування Є.О. Горбатюк, М.П. Мазур, А.С. Зенкін, В.Д. Каразей. – <http://www.tnu.in.ua/study/refs/d184/file1357975.html>

14. Нові технології виробництва ракет у КБ «Південне». – <https://www.ukrmilitary.com/2018/12/new-technology-on-kb-pivdenne.html>

15. The complete guide to machined parts. – <https://www.3erp.com/blog/the-complete-guide-to-machined-parts/>

16. Is Hybrid Manufacturing Technology the Future of Additive Manufacturing? – <https://amfg.ai/2018/07/10/hybrid-technology-the-future-of-manufacturing/>

17. Технологія машинобудування. Посібник-довідник для виконання кваліфікаційних робіт. Юрчишин І.І. та ін. – <http://www.tnu.in.ua/study/refs/d184/file1357977.html>