

## SYLLABUS OF THE COURSE "Special issues of electric machines"



<b>Academic degree</b>	<u>bachelor</u>
<b>Educational program</b>	<u>Electric power, electrical engineering and electromechanics</u>
<b>Period of study</b>	<u>5 semester</u>
<b>Classes:</b>	
lectures:	<u>2 hours</u>
laboratory classes:	<u>1 hour</u>
<b>Language of study</b>	<u>Ukrainian, English</u>

Course page in DES NTU "DP": <http://do.nmu.org.ua/course/view.php?id=3619>

Teaching department      Electrical engineering



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### 1. Annotation to the course

With the introduction of modern technologies, much attention is paid to the development of the electrical industry and its main industry - electrical engineering, which largely determines the technical level of other sectors of the economy.

Progress in the development of electrical engineering depends on the success of the theory of electric machines. A deep understanding of the processes of electromechanical energy conversion is necessary not only for electromechanical engineers who create and operate electric machines, but also for many professionals whose activities are related to power engineering, electrical engineering and electromechanics.

The course "**Special issues of electric machines**" addresses issues of design, the principle of action in the field of application of special electric machines, relating to methodological approaches to the calculation of electric machines, their modes of operation, taking into account the peculiarities of design change.

## 2. The purpose and objectives of the course

**The purpose of the discipline** is to form in future scientists competencies on the peculiarities of the work of electric machines in the framework of the elective discipline "Special issues of electric machines".

### Course objectives:

- determine the principles of construction and operation of special electric machines as components of electric power, electrotechnical electromechanical complexes and systems;
- determine the features of the work and scope of special electric machines.

## 3. Learning outcomes

After studying the course, the applicant must justify the choice of special electric machines when working in special conditions and modes based on the characteristics of the technological process and economic efficiency.

## 4. Course structure

### LECTURES

- Stepper motors
- Valve motors
- Servomotors
- Tachogenerators
- AC collector machines

### LABORATORY CLASSES

- Research of stepper motors
- Research of valve engines
- Research of servomotors
- Research of tachogenerators
- Research of alternating current collector machines

## 5. Hardware and / or software

When performing practical work, specialized measuring and electromechanical equipment and the MOODLE platform are used.

## 6. Evaluation system and requirements

**6.1.** The academic achievements of higher education students based on the results of the course will be assessed on the scale below:

Rating	Institutional
90 ... 100	Excellent
74 ... 89	Good
60 ... 73	Satisfactory
0 ... 59	Failed

**6.2.** Applicants for higher education can receive a **final grade** in the discipline on the basis of current assessment of knowledge, provided that the number of points scored in the current testing and independent work will be at least 60 points.

Maximum rating:

Theoretical part	The practical part		Bonus	<b>Together</b>
	With timely assembly	In case of untimely assembly		
65	30	20	5	<b>100</b>

The theoretical part is evaluated by the results of passing the test, which contains at least 40 questions.

**1 hour** is allotted for answering the questions of test control work  
Practical works are accepted on control questions to each of work.

### **6.3. Criteria for evaluating the final work**

At least 40 test tasks with four answer options, 1 correct answer is evaluated in 1 or 2 points depending on the difficulty (a total of 65 points). The test is conducted using Microsoft Office 365 technology.

### **6.4. Criteria for evaluating practical work**

From each practical work the applicant of higher education can receive 5 points.  
The arithmetic mean of laboratory work is multiplied by 6.

## **7. Course policy**

### **7.1. Academic Integrity Policy**

Academic integrity of higher education students is an important condition for mastering the results of training in the discipline and obtaining a satisfactory grade from the current and final tests. Academic integrity is based on the condemnation of the practices of copying (writing with external sources other than those permitted for use), plagiarism (reproduction of published texts by other authors without attribution), fabrication (fabrication of data or facts used in the educational process). The policy on academic integrity is regulated by the Regulation "Regulations on the system of prevention and detection of plagiarism at the Dnipro University of Technology" [http://www.nmu.org.ua/ua/content/activity/us\\_documents/System\\_of\\_prevention\\_and\\_detection\\_of\\_plagiarism.pdf](http://www.nmu.org.ua/ua/content/activity/us_documents/System_of_prevention_and_detection_of_plagiarism.pdf)

In case of violation of academic integrity by the applicant (copying, plagiarism, fabrication), the work is evaluated unsatisfactorily and must be repeated. The teacher reserves the right to change the topic of the task.

### **7.2. Communication policy**

Applicants for higher education must have activated university mail.

All written questions to teachers regarding the course should be sent to the university e-mail.

### **7.3. Reassembly policy**

Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Reassignment takes place with the permission of the dean's office if there are good reasons (for example, sick leave).

### **7.4 Evaluation Appeal Policy**

If the applicant does not agree with the assessment of his knowledge, he may protest the assessment given by the teacher in the prescribed manner.

### **7.5. Attending classes**

For full-time higher education students, attendance is mandatory. Good reasons for not attending classes are illness, participation in university events, academic mobility, which must be documented. The applicant for higher education must inform the teacher either in person or through the headmaster about the absence from classes and the reasons for absence.

For objective reasons (for example, international mobility) training can take place online in consultation with the course leader.

### **7.6. Bonuses**

At the end of the study course teacher can add getter in higher education to 5 for personal activity during lectures and practical exercises, participation in scientific-technical part are conferences, seminars and others.

## **8 Recommended sources of information**

### **Basic**

1. Pivnyak GG, Dovgan VP, Shkrabets FP Electric machines: A textbook. - Dnepropetrovsk: National Mining University, 2003. - 327 p.
2. Belikova L.Ya., Shevchenko VP Electric machines: A textbook. - Odessa: Science and Technology, 2012. - 480 p.
3. Yatsun Ya.A. Electric machines: Textbook. - Lviv: Lviv Polytechnic Publishing House, 2011. - 464 p.
4. Tsiplenkov DV, Ivanov OB, Bobrov OV Design of electric machines: Textbook. manual / D.V. Tsiplenkov, O.B. Ivanov, OV Bobrov and others. - D: NTU "DP", 2020. - 408 p.
5. Ivanov, OB, Shkrabets, FP, Zawilak, Jan. (2011). "Electrical generators driven by renewable energy systems", Wroclaw University of Technology, Wroclaw - 169 p.
6. Electric machines and transformers: textbook. Manual / M.O. Ostashevsky, O.Yureva.; for order. Dr. Tech. Sciences, Professor VI Cute. - Kyiv: Karavela, 2018. - 452 p.

### **Additional**

1. Bruskin D.E. etc. Electric machines and micromachines / D.E. Bruskin, A.E. Zorohovich, V.S. Hvostov. - 3rd ed., Reworked. and ext. - M.: Higher. school., 1990. - 528 p.
2. Ivanov-Smolensky AV Electric machines: A textbook for universities. -M.: Energy, 1980. - 928 pp.

3. Tokarev BF Electric machines: Textbook. manual for universities.- M.: Energoatomizdat, 1990.-624 p .

4. Calculation of transformers: Textbook. allowance / P.M. Tikhomirov. - M .: Energoatomizdat, 1986. - 517 p.

5. Khvostov VS Electric machines: DC machines: Textbook. for students. electromech. special universities / Ed. I.P. Kopilov. - M.: Higher. school., 1988. - 336 p .

6. Radin VI etc. Electric machines: Asynchronous machines: Textbook. for students. electromech. special universities / Radin VI, Bruskin DE, Zorokhovich AE; Ed. I.P. Kopilov. - M .: Higher. school., 1988. - 328 p.

7. Osin IL, Shakaryan Yu.G. Electric machines: Synchronous machines: Textbook. manual for students. electrom. special universities / Ed. I.P. Kopylova - M.: Higher school, 1990. - 304 p .

8. Voldek AI Electric machines. Textbook for university students. tech. textbook routine. Ed. 3rd, reworked. and ext. L .: Energiya, 1978. - 832 p.

9. Booth DA Contactless electric machines / D. A. Booth. M.: Higher. school, 1990. 416 p.

10. Collection of methodical materials for laboratory work on discipline "Special issues of electric machines" for students studying specialty 141 "Electrical Power Engineering, Electrical Engineering and Electromechanics" / Kolb AA; Dnipro University of Technology – D.: DniproTech, 2021. – 19 p.