

ACADEMIC DISCIPLINE SYLLABUS

«Computer Graphics»



Educational Level	First (bachelor)
Educational-Professional program	Electric Power Engineering, Electrical Engineering and Electromechanics
Duration of teaching	2,3,4 quarters
Classes:	
lectures	29h
Laboratory classes	17h
Language of teaching	English

Course page in the system of distance education of DUT:

<https://do.nmu.org.ua/course/view.php?id=974>

Department of Generative Design

Teacher information

Fedoriachenko Serhii	PhD
Personal web-page	https://okmm.nmu.org.ua/ua/Fedoriachenko.php
E-mail:	Fedoriachenko.s.o@nmu.one

1. Annotation to the course

Engineering and computer graphics is aimed at studying and mastering methods of depicting spatial bodies on a plane and making drawings in accordance with the state standard with the use of modern computer technology.

2. The purpose and objectives of the discipline

The aim is to develop competencies in the means of depicting spatial forms on a plane with the use of computer technology, which is the foundation on which the basic rules of technical drawing are based. This is necessary for personnel in higher education in technical specialties, whose future production functions are related to the preparation of design documentation that should meet the needs of production.

Course objectives:

- Providing students with basic information on the rules of drawing in accordance with the System of Design Documentation (SDD) and the standards of ESDD (Unified system of design documentation);
- to acquaint students with the methods of projection drawing;
- to acquaint students with ways to perform graphic images;
- to acquaint students with ways to construct complex lines of mutual intersection of surfaces;
- provide students with information about the construction and reading of drawings (views, sections, sections);
- to acquaint students with the rules of drawing sizes, images of threads and fasteners;
- to acquaint students with the rules of execution of drawings of detachable and non-detachable connections;

- provide information to students on the rules of assembly drawings and technical documentation;
- provide students with information on reading and detailing assembly drawings.
- to get acquainted with the rules of implementation and output of graphic information in automated image creation (in Autodesk AutoCAD);
- to get acquainted with the main commands of the Autodesk AutoCAD graphics system for creating drawings;
- provide information on the basic concepts, rules and commands of spatial modeling in Autodesk AutoCAD;
- to get acquainted with the complexes of operations of graphic systems that allow you to create and modify three-dimensional models of parts and their drawings;
- to get acquainted with the methods of developing complete sets of design documentation in the Autodesk AutoCAD package.

3. Learning outcomes

- Use the concepts and laws of descriptive geometry to formulate and solve scientific and scientific-technical problems with the reflection of geometric objects on the plane;
- Master the general and professional skills to solve applied graphic problems and methods of processing;
- Use the tools of modern information technology AutoCAD system to perform drawings of parts, complex conjugations, three-dimensional models and schematic diagrams.

4. Course structure

Lectures
Topic 1 Preface. Point. Central, parallel and orthogonal projections. Point and its projections. G. Monge's method. The law of projection.
Topic 2 Straight. Position of the line relative to the planes of projections. The natural value of the line of general position, its angles of inclination to the planes of projections.
Topic 3 Traces of a straight line. Reciprocal position of a point and a line, two lines. Projection of angles.
Topic 4 Plane. Ways to set the plane on a complex drawing. Classification of planes. Straight and point in the plane.
Topic 5 Basics of drawing. Basic rules of drawing.
Topic 6 Projection of geometric bodies. Projections of a point and a straight line belonging to the surface of an object. Construction of the third projection on two given.
Topic 7 Images. Planes. Sections. Incisions. Classification of sections.
Topic 8 Working machine-building drawings. Text inscriptions on drawings. Designation of materials on drawings of details. Schematic electrical diagrams.
Topic 9 Threads. Conventional image and designation of the thread. Elements of Threads.
Topic 10 Standard threaded fasteners and their designations. Threaded connections
Topic 11 Basic rules for sketches and working drawings.
Topic 12 Reading and detailing assembly drawings. Features of the design of the assembly drawing. Specifications.
Laboratory classes
Introduction to the AutoCAD interface. Graphic primitive and editing commands in AutoCAD. Development of a template for drawings.
Conjugate geometric objects.
2D drawing of three kinds of details on the visual image.
2D drawings of three types of parts for two given types. Making the necessary incisions.
Виконання кресленика принципової електричної схеми.

Building a 3D model of a simple detail. Creating associative base views and sections from a 3D model.
Building a 3D model of a complex part. Creating associative base views and sections from a 3D model.

5. Tools, equipment and software *

Technical training

Activated university mail account (student.i.p. @ Nmu.one) at Office365.

Electronic library of the department for educational and methodological support of the discipline.

Software: Windows, MS Office, Autodesk AutoCAD

MOODLE remote platform.

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 scale	Institutional scale
90 – 100	Excellent
74-89	Good
60-73	Satisfactory
0-59	Fail

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 current testing, weighted average laboratory work and practical tasks, independent work will be at least 60 points.

The theoretical part is evaluated by the results of passing the test.

6.3. Criteria for evaluating the final work

30 test tasks with four answer options, 1 correct answer is evaluated in 1 point; (a total of 30 points), 6 test tasks with four answer options, 1 correct answer is evaluated in 2 points (a total of 12 points); 2 problems with four answer options, 1 correct answer is evaluated in 4 points; 3 problems with four answer options, 1 correct answer is evaluated in 5 points (a total of 23 points); 7 theoretical questions with a detailed answer, the correct answer is estimated at 5 points (a total of 35 points).

The test is conducted using Google Forms technology, MS Office 365.

An untimely response is considered not to have been submitted.

6.4. Criteria for evaluating practical work

From each practical work the applicant of higher education receives for the decision one task on a subject of employment.

6.5. Criteria for evaluating laboratory work

From each laboratory work the applicant of higher education receives for performance a separate variant according to methodical instructions.

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 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.

In case of violation of academic integrity by a higher education 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. Retaking policy

Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Relocation 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 higher education students, full-time attendance is mandatory. For applicants for higher education who receive educational services under the Dual form of education, an individual schedule is provided. 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, academic mobility) training can take place online in consultation with the course leader.

8.Literature

1. . Інженерна та комп'ютерна графіка [Текст]: підручник для студентів вищих закл. освіти /О.І. Додатко. – Д.: “Національний гірничий університет”, 2010. – 286 с.
2. Інженерна графіка в гірництві [Текст]: навч. посібник /О.І. Додатко. – 3-тє вид. доп. та виправл. – Д.: ДВНЗ “Національний гірничий університет”, 2011. – 281 с.
3. Ванжа Г.К.Машинобудівне креслення [Текст]: навч. посібник / Г.К. Ванжа, О.О. Якушева, Г.С. Тен, І.В. Вернер. – Д.: Національний гірничий університет, 2011. – 168 с.
4. «Нарисна геометрія та інженерна графіка (розділ «Нарисна геометрія»). Методичні вказівки до аудиторної і самостійної робіт для студентів напряму підготовки 6.050301 Гірництво / О.С.Жовтяк, Т.С.Савельєва, Г.С. Тен - Д.: ДВНЗ «НГУ», 2016. – 55 с.
5. Методичні рекомендації з геометричного та проєкційного креслення з дисципліни «Інженерна графіка»/О.С. Жовтяк, Т.С. Савельєва, Д. С. Пустовой, – Дніпро: ДВНЗ «НГУ», 2017. – 64 с.
6. Методичні рекомендації з виконання креслення нарізей з дисципліни «Інженерна графіка» за спеціальністю 184 «Гірництво» /О.С. Жовтяк, Т.С. Савельєва, Д. С. Пустовой, – Дніпро: ДВНЗ «НГУ», 2018. – 43 с.
7. Інженерна графіка. Методичні рекомендації з проєкційного креслення / Т.С. Савельєва, Д.С. Пустовой; Нац. техн. ун-т «Дніпровська політехніка». – Дніпро: НТУ «ДП», 2020. – 52 с.
8. Ванжа Г.К. Геометричне креслення [Текст]: навчально-наочний посібник / Г.К.

- Ванжа, О.С. Жовтяк, О.О. Якушева, А.С. Тен – Д.: Національний гірничий університет, 2013. – 242 с.
9. Ванжа Г.К. Проекційне креслення [Текст]: навчально-наочний посібник / Г.К. Ванжа, С.В. Балашов, Т.А. Кузнецова, О.В. Федоскіна – Д.: Національний гірничий університет, 2013. – 242 с.
10. Ванжа Г.К. Складальне креслення [Текст]: навчально-наочний посібник / Г.К. Ванжа, О.С. Жовтяк, О.О. Якушева, І.В. Вернер – Д.: Національний гірничий університет, 2013. – 242 с.
11. Основи використання системи комп'ютерної графіки AutoCAD 2007. Методичні рекомендації донавчально-комп'ютерної практики для студентів напряму підготовки 6.050301 Гірництво / О.І. Додатко, С.В. Балашов, О.С. Жовтяк, Т.С. Савельєва; заред. О.І. Додатка. – Д.: Національний гірничий університет, 2010. – 56 с.
12. Графічне оформлення схем електричних принципів. Методичні вказівки до практичних занять для студентів напрямів підготовки 0501 інформатика та обчислювальна техніка; 0502 автоматика та управління; 0507 електротехніка та електромеханіка; 0509 радіотехніка, радіоелектронні апарати та зв'язок; 0510 метрологія, вимірювальна техніка та інформаційно-вимірювальні технології та 1701 інформаційна безпека./ С.В.Балашов, Л.М.Благодарна, Г.С.Тен.– Дніпропетровськ.: НГУ, 2010.–30 с.
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15. «Інженерна графіка» (розділ «Комп'ютерна графіка») Методичні рекомендації до виконання лабораторних робіт / Т.С. Савельєва, О.О. Якушева, О.В. Федоскіна –Д.: НГУ, 2013. – 38 с.
16. AutoCAD for Engineering Graphics, Gary R. Bertoline, 592p. ISBN: 9780023090424