

Subject

Development of electromechanical robotic systems

[Link to the curricula](#)

Study unit code **OC1.2**

2020

Level	Study program or it's part	Year	Semester
2	ELECTRONICS OF ROBOTIC SYSTEMS AND COMPLEXES	4	Autumn

ECTS credits **4**

Hours - Lectures	16
Hours - Laboratory Work	14
Hours - Practical, Seminars	
Hours - Individual Student's Work	90

Lecturers

Assoc. prof. VOLODYMYR VOITENKO

Languages - lectures	English
Languages - tutorial	English

Prerequisites

Basic knowledge of programming, semiconductor physics and electronic devices.

Content (Syllabus outline)

The subject of studying are an architecture of electromechanical robotic systems, purposes which are using in industry, agriculture, military equipment, transport, everyday life and more. Contents: mechatronic, computer vision, power electronics; microprocessor technology; automatic control systems; image processing and information display systems; embedded systems.

Textbooks

• Charles Platt. Make: Electronics, Second Edition. Maker Media, 2015. - 349 p. • Thomas C. Hayes with the assistance of Paul Horowitz. Learning the Art of Electronics: A Hands-On Lab Course. Cambridge University Press, 2016. - 1162 p. • Gonzalez R. C., Woods R. E. Digital Image Processing. Prentice Hall, 2002. - 813 p. • Peter Corke. Robotics, Vision and Control. Fundamental Algorithms in MATLAB. Springer International Publishing AG 2017. - 693 p.

Objectives

The main purpose of studying this course is to expand the worldview of the bachelor of electromechanical robotic systems with the basics of building industrial robots and by in-depth mastering of English professional terminology in the field of robotics

Intended learning outcomes - knowledge and understanding

On completion of this course the student will be able to demonstrate: • understanding of classes, current state and development trends of robotics systems; • knowledge of the mechatronic systems building basics; • knowledge of English terminology in the field of robotic systems; • practical mastery of skills in adjustment, control and measurement of parameters of robotic systems.

Intended learning outcomes - transferable/key skills and other attributes'

Communication skills: writing of professional report concerning finished exercise, oral lab work defense, manner of expression at written examination. Use of information technology: using the instrumental software for programming of microcontrollers, Image Processing and Computer Vision Toolboxes for MATLAB.

Learning and teaching methods

• Lectures, • lab work, • practical assignment.

Assessment	Weight (%)	
Lab work	50	
Practical assignment	50	

Comments

--

Subject

Introduction to electronic systems

[Link to the curricula](#)

Study unit code **OC1.2?**

2020

Level	Study program or it's part	Year	Semester
2	ELECTRONICS OF ROBOTIC SYSTEMS AND COMPLEXES	4	Autumn

ECTS credits **6**

Hours - Lectures	26
Hours - Laboratory Work	24
Hours - Practical, Seminars	
Hours - Individual Student's Work	130

Lecturers

Assoc. prof. VOLODYMYR VOITENKO

Languages - lectures	English
Languages - tutorial	English

Prerequisites

Basic knowledge of programming, semiconductor physics and electronic devices.

Content (Syllabus outline)

The subject of studying are electronic systems for various purposes which are using in industry, agriculture, military equipment, medicine, transport, everyday life and more. Contents: information electronics; power electronics; microprocessor technology; automatic control systems; image processing and information display systems; embedded systems; IoT devices; electronic systems software; calculation and modeling of electronic systems; machine learning in electronic systems.

Textbooks

• Charles Platt. Make: Electronics, Second Edition. Maker Media, 2015. - 349 p. • Thomas C. Hayes with the assistance of Paul Horowitz. Learning the Art of Electronics: A Hands-On Lab Course. Cambridge University Press, 2016. - 1162 p. • Gonzalez R. C., Woods R. E. Digital Image Processing. Prentice Hall, 2002. - 813 p. • Peter Corke. Robotics, Vision and Control. Fundamental Algorithms in MATLAB. Springer International Publishing AG 2017. - 693 p.

Objectives

The main purpose of studying this course is to expand the worldview of the bachelor of electronics by getting acquainted with the basics of building electronic systems and by in-depth mastering of English professional terminology in the field of electronics.

Intended learning outcomes - knowledge and understanding

On completion of this course the student will be able to demonstrate: • understanding of classes, current state and development trends of electronic systems; • knowledge of the electronic systems building basics; • knowledge of English terminology in the field of electronic systems; • practical mastery of skills in adjustment, control and measurement of parameters of electronic systems.

Intended learning outcomes - transferable/key skills and other attributes'

Communication skills: writing of professional report concerning finished exercise, oral lab work defense, manner of expression at written examination. Use of information technology: using the instrumental software for programming of microcontrollers, Image Processing and Computer Vision Toolboxes for MATLAB.

Learning and teaching methods

• Lectures, • lab work, • practical assignment.

Assessment	Weight (%)	
Lab work	50	
Practical assignment	50	

Comments

--