	Силабус навчальної дисципліни «Сенсори і актюатори інтернету речей» англійською мовою **SYLABUS** **IoT Sensors and Actuators** **Specialty: 171 Electronics** **Field of knowledge: 17 Electronics and telecommunications** **Educational Program: Electronic Technologies of IoT**
Level of higher education	First (bachelor)
Discipline status	The discipline of the main component of the professional list
Semester	Spring (6)
Volume of discipline, credits / total number of hours	6 credits / 180 hours
What is studied (ECTS subject of study)	The place of this course in the system of professional training: this course is the theoretical and practical basis of the set of knowledge and skills that form the profile of a Bachelor in electronic technologies of the Internet of Things. The purpose of teaching the course is to master the theoretical knowledge and practical skills on the basics of construction and use of primary signal converters of different physical nature, which is one of the basic foundations of electronic technologies of the Internet of Things. The objectives of the course are: - acquaintance with definitions, terminology and classification of primary converters; - mastering the basics of methods for constructing primary converters, in particular based on the principles of microsystems; - study of the principles of operation, transformation methods and structures of various sensors; - study of the principles of functioning, methods of transformation and structures of the main executive mechanisms.

Educational logistics	**Course content:** The educational material of the course is structured on a modular basis and consists of three educational modules, namely: Training module №1 "Fundamentals of converters of physical quantities"; here the role of sensors and actuators in IoT, physical bases of signal conversion by sensors and actuators, and basics of design and manufacturing technologies of micro-electromechanical systems (MEMS) are studied. Training module №2 "Principles of construction of sensors"; here the construction and operation of sensors based on different principles are studied. Training module №3 "Principles of construction of actuators"; here construction and operation of actuators are studied. Each module is a logically complete, relatively independent, integral part of the discipline, the mastering of which involves a modular test and analysis of the results of its implementation. **Types of classes:** Lectures, practical classes, laboratory classes. **Teaching methods:** Narration, discussion, exercises (tasks), modeling, online work. **Forms of education:** Form of study: full-time or distance.
Information support	1. Nebylov, J. Watson, F. Yanovsky et al. “Aerospace Sensors,” Momentum Press, USA, 2012, 576 pp. 2. Fennimore A.M., Yuzvinsky T.D., Wei-Qiang Han et al. “Rotational actuators based on carbon nanotubes,” Nature, 2003. — V. 424. — P.408—410. 3. Clarence W. de Silva, “Sensor Systems: Fundamentals and Applications,” CRC Press, 2016. - 746 pp. 4. Francisco Andre Correa Alegria, “Sensors And Actuators,” World Scientific, 2021. - 404 pp. 5. Robert H. Bishop, “Mechatronic Systems, Sensors, and Actuators: Fundamentals and Modeling,” CRC Press, 2017 - 692 pp. 6. John G. Webster, Halit Eren, “Measurement, Instrumentation, and Sensors Handbook,” Second Edition: Spatial, Mechanical, Thermal, and Radiation Measurement, 2014. - 1640 pp.
Teacher	 **Felix J. Yanovsky** **Position:** Professor **Scientific degree:** Doctor of Science (Eng.), PhD, **Scientific Title:** Professor, IEEE Life Fellow **Profile:** http://kafelec.nau.edu.ua/sklad_yanovsky-ukr.html http://radar.ewi.tudelft.nl/People/bio.php?id=353 https://www.linkedin.com/in/felix-yanovsky-2901504/ **Тел.:** +380962251493 **E-mail:** yanovsky@nau.edu.ua; felix.yanovsky@ieee.org
Originality of the academic course	Author's course; teaching in English or Ukrainian (at the request of students)

Head of the Department V. Shutko

Author F. Yanovsky