Syllabus of educational discipline
«POWER ELECTRONICS»
Educational and professional programs:
"Electronic technologies of Internet of Things"
Specialty: 171 Electronics
Field of knowledge: 17 Electronics and telecommunications

Higher education level	1 (Bachalor)
Discipline status	Educational discipline of the selective component of professional training
Course	3
Semester	6
The scope of discipline, ECTS credits / hours	4 credits / 120 hours
Teaching language	Ukrainian, English
What will be studied (subject of study)	Physical principles of functioning of modern power electronics, itselement base, principle of operation, composition, circuitry and hardwareimplementation of typical units of power conversion equipment anddevices that are traditionally used in power systemselectronics. Development of skills: - tochoice (according to the problem to be solved)appropriate element base and circuit solutions that provide modes of safe operation of semiconductorsdevices; - development of functional and basic schemes of powerelectronic devices; - definition of parameters, static ordynamic characteristics of individual elements and power electronic devices by mathematical modeling usingspecialized packages
Why it is interesting/necessary to study (goal)	The purpose of this discipline is the formation of knowledge, skills and abilities that are necessary to understand the basics of construction of power electronics devices,used in modern IoT systems
What can be learned (learning outcomes)	PRN1.To describe the principle of action using scientific concepts, theories, methods and verify results in design and application for devices and electronics systems. PRN3. To find solutions to practical problems of electronics byapplication of appropriate models and theories of electrodynamics,analytical mechanics, electromagnetism, statistical physics, physics of solid body. PRN12. To use professional documentation for activities, using of modern technologies and office facilitiesequipment; useof English, including specialterminology, for communication with specialists, conducting literarysearch and texts reading on technical and professional topics. PRN15. To demonstrate skills of independent and collective work, leadershipquality, organize work for a limited time with an emphasis onprofessional integrity. PRN19. To demonstrate deep knowledge in such areas of electronicsas digital measuring equipment, microwave electronics,radiating devices, aviation embedded electronic systems

How can you use the acquired knowledge and skills (competences)	ZK1. Ability to apply knowledge in practical situations. ZK2. Knowledge and understanding of the subject area and understanding of the professional activities. ZK7. Ability to search, process and analyze information from differentsources. ZK9. Ability to work in a team. FC1. Ability to use knowledge and understanding of scientific facts, concepts, theories, principles and methods for designing and application of devices, devices and systems of electronics. FC2. Ability to perform analysis of subject area and normative documentation required for the design and application of devices and electronical systems. FC 9.Ability to determine and evaluate characteristics and parameters of materials of electronic equipment, analog and digital electronicdevices for designing microprocessor and electronic systems. FC13. Ability to analyze and design radiating devices and electronic systems.
Educational logistics	**Course contents:** Element base of converters of constant andalternating current. Single-phase rectification circuits.Three-phase circuitsstraightening.Reversible rectifiers. Pulse converters are constantvoltage. Autonomous inverters.AC converters.Features of application of devices and systems of power electronics. **Types of classes:** Lectures and practical works. **Teaching methods:** student-oriented learning, presentations,conversations and discussions, others.
Prerequisites	Based on such disciplines as: "Higher Mathematics", "Physics","Theory of electric circuits", "Fundamentals of analog electronics"
Requisites	Is the basis of such disciplines as: "Electronic systems", "Fundamentalsof electronic devices design" and others.
Information support from the repository and fund of NTB NAU	1. Кириленко О.В. , Жуйков В.Я., Денисюк СП., Рибіна О.Б. Системи силової електроніки та методи їх аналізу. - К.: "Текст", 2006. - 488 с 2. Перетворювальна техніка. Підручник. Ч. 2 / Ю.П. Гончаров, О.В. Будьон-ний, В.Г. Морозов, М.В. Панасенко, В.Я. Ромашко, В.С. Руденко. За ред. В.С. Руденка. – Харків: Фоліо, 2000. – 360 с 3. Розанов Ю.К., Рябчицкий М.В., Квасюк А.А. Силовая электроника: Учеб-ник для вузов. - М.: Издательский дом МЭИ, 2007. - 632 с 4. Семенев Б. Ю. Силовая электроника: от простого к сложному / Б. Ю. Семенев. – М. : СОЛОН-ПРЕСС, 2008. – 416 с. 5. Зиновьев Г. С. Основы силовой электроники: ученик / Г. С. Зиновьев. – Новосибирск : Изд-во НГТУ, 1999. Ч.1. – 199 с.
Location and logistics	Build. 3, rooms 3/322, 3/324. Computers with specialized programs, projector, screen
Semester testing and examination methodology	Differentiated graded test, modular testing

Department	Electronics, robotics, monitoring and IoT technologies
Faculty	Aeronavigation, electronicsandtelecommunications (FAET)
Teacher	**ZADOROZHNIY Roman Oleksandrovich** **Posada:** Associate Professor **Phone:** 097-860-60-86 **E-mail:** zr@nau.edu.ua **Workplace:** 3-317
Originality of academic discipline	Author's course; original tasks for practical work
Link to discipline	After the student group formation, an office in GoogleClassroom with necessary training materialsis created

Developer **Volodymyr Ulansky**

Head of the Department **Roman Zadorozhniy**