Discipline	Mathematical modeling of systems of protection of electrotechnical complexes against electromagnetic effects of lightnings
Level of HE	Third (educational and scientific)
Course	2
Scope	4 ECTS credits
Language of instruction	Ukrainian, English
Department	Theoretical electrical engineering
Requirements for the beginning of study	Basic knowledge of general physics, theoretical foundations of electrical engineering, industrial electronics, electromagnetic compatibility of technical means. Initial ideas about the main types and characteristics of electrical equipment in electrical and other systems and installations for which the electromagnetic effects of lightning discharges can be critical.
What will we study?	Methods and means of registration of lightning characteristics: fact, place and time of occurrence of atmospheric electric discharges and shocks, parameters of pulse and long currents, charges, electromagnetic fields, etc. Lightning discharge models to justify the choice of the necessary algorithms and characteristics of automated systems and means of registration. Registration of lightning characteristics on tall buildings, power lines, wind power plants and other facilities. Lightning activity warning systems. Remote lightning detection systems. Research with artificially initiated lightning. Regulations. Analysis of these registration systems and recommendations for their use.
Why this is interesting / worth learning	The development of modern lightning protection systems should be based on reliable data on lightning activity and the characteristics of the various components of lightning discharges. It is important to have such data for certain types of objects and regions. They can be obtained by automated registration of lightning on individual buildings and using remote systems.
Why you can learn (learning outcomes)	Orient in methods and means of registration of lightning characteristics. Get acquainted with the models of lightning discharge, which are used to develop their registration systems and protection systems. Analyze data from lightning detection systems and use them to develop lightning protection systems for various objects.
How to use the acquired knowledge and skills (competences)	Reasonably develop or choose means and systems for registration of lightning characteristics. Analyze data from lightning detection systems and use them to develop lightning protection systems for various objects (direct and indirect actions).
Information support	Syllabus, teaching materials (manuals, presentations for lectures, etc.), standards.
Form of conducting classes	Lectures, practical classes.
Semester control	Test