Назва дисципліни	**3у-10-31 The theory of optimal control**
Рекомендується для галузі знань *(спеціальності, освітньої програми)*	For all specialties (discipline of university choice)
Кафедра	Cybersecurity and computer-integrated technologies
П.І.П. НПП *(за можливості)*	Petrenko O.M.
Рівень ВО	Third (Education and Science)
Курс *(на якому буде викладатись)*	1-2 course
Мова викладання	English language
Вимоги до початку вивчення дисципліни	-
Що буде вивчатися	The first section presents a description of the problems of optimal control of technical systems. Optimality criteria are considered. Approaches to the analysis of systems using the concept of state space are given, the concepts of controllability and observability of systems are given. The second section is devoted to the analysis and design of linear systems, taking into account the influence of disturbances, observational noise and uncertainty in the knowledge of plant parameters. The methods and recommendations presented here are illustrative and have a clear physical meaning. The third section considers approaches to constructing optimal linear systems in the presence of complete information about the state of the system. At the same time, the main attention is paid to such basic tasks as the synthesis of a deterministic controller with the study of its properties, the construction of servo systems and stabilization systems. In the fourth section, an independent problem of estimating the phase state of a linear control system is considered, the solution of which is carried out in the presence of random disturbances. Each section is accompanied by examples and testing questions which help students progress through the course.
Чому це цікаво/треба вивчати	This discipline is intended for masters and graduate students who are trained in the specialty "Automation and control in technical systems"
Чому можна навчитися *(результати навчання)*	The ability to apply knowledge and understanding to solve problems in the synthesis and analysis of elements and systems characteristic of the chosen research area. To be able to investigate and model phenomena and processes in complex systems of automatic control of technological processes. To apply a systemic approach, integrating knowledge from other disciplines and taking into account non-technical aspects, in solving theoretical and applied problems in the chosen research area.
Як можна користуватися набутими знаннями і уміннями (компетентності)	The ability to demonstrate knowledge of the current state of scientific achievements in the field of automation and computer-integrated technologies, as well as in related fields. The ability to demonstrate knowledge and understanding of contemporary scientific theories and methods, and the ability to effectively apply them to the analysis, synthesis, and optimization of systems of automated control of technological processes and computer-integrated technologies.
Інформаційне забезпечення	FTF Library, DNU Library, DNU Repository, FTF Repository
Види навчальних занять *(лекції, практичні, семінарські, лабораторні заняття тощо)*	lectures and practical activities
Вид семестрового контролю	Differential gap
Максимальна кількість здобувачів	No boundaries
Мінімальна кількість здобувачів	-