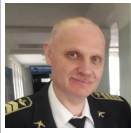**The syllabus of the discipline
"NUMERICAL METHODS AND PROGRAMMING IN AVIATION
ELECTRONICS"
Educational and professional programs: "Electronic systems",
"Electronic technologies of the Internet of Things", "Computerized
means of monitoring the use of frequency resources"
Specialty: 171 Electronics
Field of knowledge: 17 Electronics and telecommunications**

Levelofhighereducation	First (bachelor's)
Disciplinestatus	Academic discipline of the selective component of the professional list
Course	3
Semester	Autumn
Volume of discipline, ECTS credits / total number of hours	3.5 credits / 105 hours
Languageofinstruction	Ukrainian
What will be studied (subject of study)	Theoretical material on the basics of numerical analysis and operations research, practical mastering of basic numerical methods and skills of their application to solve mathematical problems arising in the development of information systems.
Why it is interesting / necessary to study (goal)	• mastering knowledge in the field of practical methods for solving mathematical problems arising in the process of engineering, • mastering the methods of calculations on modern computers with the use of packages of special applications.
Why you can learn (learning outcomes)	Apply knowledge and understanding of differential and integral calculus, algebra, functional analysis of real and complex variables, vectors and matrices, vector calculus, differential equations in ordinary and partial derivatives, Fourier series, statistical analysis, information theory, numerical methods to solve theoretical and applied problems of electronics. Find solutions to practical problems of electronics by applying appropriate models and theories of electrodynamics, analytical mechanics, electromagnetism, statistical physics, solid state physics. Evaluate the characteristics and parameters of electronic materials, understand the basics of solid-state electronics, electrical engineering, analog and digital circuitry, converter and microprocessor technology. To use the documentation connected with professional activity, with application of modern technologies and means of office equipment; use English, including special terminology, to communicate with experts, conduct literary searches and read texts on technical and professional topics. Be able to learn new knowledge, advanced technologies and innovations, find new non-standard solutions and means of their

	implementation; meet the requirements of flexibility in overcoming obstacles and achieving goals, rational use and regulation of time, discipline, responsibility for their decisions and activities. Adhere to the norms of modern Ukrainian business and professional language. Demonstrate skills of independent and collective work, leadership qualities, organize work in a limited time with an emphasis on professional integrity.
How to use the acquired knowledge and skills (competencies)	Ability to apply knowledge in practical situations. Knowledge and understanding of the subject area and understanding of professional activity. Ability to use the basics of basic sciences for the development of professionally-oriented disciplines. Knowledge and understanding of prospects of development of software and hardware of cryptographic protection of information. Ability to use knowledge and understanding of scientific facts, concepts, theories, principles and methods for the design and application of devices, devices and systems of micro- and nanosystem technology. Ability to perform analysis of the subject area and regulatory documentation required for the design and application of devices and devices of micro- and nanosystem technology. Ability to use mathematical principles and methods for the design and application of micro- and nanosystem technology. Ability to apply appropriate scientific and engineering methods, modern information technology and computer software, computer networks, databases and Internet resources to solve professional problems in the field of micro- and nanosystem technology. Ability to identify, classify, evaluate and describe processes in micro- and nanosystem technology by constructing and analyzing their physical and mathematical models. Ability to integrate knowledge of fundamental sections of mathematics and physics to understand the processes of functional micro- and nanoelectronics.
Educationallogistics	**Content of the discipline:** general concepts related to numerical methods; statement of typical mathematical problems; numerical methods for solving systems of linear and nonlinear equations; methods for calculating eigenvalues and eigenvectors of the matrix; numerical methods of approximation of functions; design, programming, testing and debugging of programs that implement numerical methods. **Types of classes:** Lectures, practical classes, laboratory classes **Teaching methods:** Story, discussion, practical tasks, online work. **Forms of study:** full-time, distance
Prerequisites	"Higher Mathematics" and "Fundamentals of Algorithmization and Programming in Electronics"
Details	"Fundamentals of electronic device design", "Electronic systems"

Information support from the fund and repository NTB NAU	1. Collins George W. Fundamental numerical methods and data analysis. – 2003. 2. Johnston R.L. Numerical methods: a software approach. – New York, 1982. 3. Morgan Don Numerical methods: real-time and embedded system programming, 1982.
Location and logistics	Auditorium fund of the ERMIT department, computer classes, multimedia equipment
Semestercontrol, examinationmethods	Differentialcredit
Chair	Electronics, robotics and monitoring technologies and the Internet of Things
Faculty	FAET
Teacher(s)	**ShutkoVolodymyrMykolayovych** **Position:** head of the department **Scientific degree:** Doctor of Technical Sciences **Academic title:** Professor **Teacher profile:** **Tel .:** (044) 406-71-30 **Email:** volodymyr.shutko@npp.nau.edu.ua **Workplace:** 3.407
Originalityofacademicdiscipline	Author's course; teaching in English
Linktodiscipline	