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DESCRIPTION/Syllabi of Curricula/Module

Short Name of the University/Country code Date (Month / Year)	
TITLE OF THE MODULE	**Code**
Module name: Design and computer simulation linear and non-linear RF systems Course name: Simulation in radiofrequency systems	M2.1 M2.6

Teacher(s)	Department
Coordinating: Morshchavka Sergii **Others:** Lecturer: Polyakov Mykhailo	Radio Engineering and Telecommunication Radio Engineering and Telecommunication

Study cycle (BA/MA)	Level of the module (Semester number)	Type of the module (compulsary/elective)
MA	2	compulsary

Form of delivery (theory/lab/exercises)	Duration (weeks/months)	Language(s)
Theory/lab/course work	15	Ukrainian (English on demand)

Prerequisites	
Prerequisites: CAD/CAM/CAE basics Radiofrequency circuits and signals Digital signal processing	**Co-requisites (if necessary):** The desired minimum knowledge in electronics and PCB design µ

ECTS (Credits of the module)	Total student workload hours	Contact hours	Individual work hours
3	90	28	62

Aim of the module (course unit): competences foreseen by the study programme
The aim is the study of the basic principles, methods and stages of computer-aided design and simulation of radiofrequency electronic devices, biomedical systems and processes

Learning outcomes of module (course unit)	Teaching/learning methods (theory, lab, exercises)	Assessment methods (written exam, oral exam, reports)
Willingness to set goals, making task definition and set their priorities, prepare terms of reference for design work	Theory - classroom teaching	No specific assessment is made on this module: this is evaluated in the reports for the hands-on sessions.
Willingness to independently carry out the formulation of the research problem, the formation of a plan for its implementation, the choice of research methods and the processing of results	Theory - classroom teaching	No specific assessment is made on this module: this is evaluated in the reports for the hands-on sessions.
The ability to design a radio apparatus, devices, systems and complexes in accordance with the defined requirements	Hands on lab session	Report on lab session
Ability to perform simulation of the objects and processes in the fields of radio engineering and biomedical devices	Hands on lab session	Report on lab session
The ability to analyze and optimize parameters using available research tools, including standard software packages		

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practiacl work	Laboratory work	Placements	**Total contact work**	**Individual work**	**Tasks**
1. Models of complex systems, the concept of analytical and simulation research methods.	4				3		7	20	Developing of physical models for radiofrequency systems
2. Mathematical and physical modeling and simulation of radio engineering devices and biomedical systems	4				3		7	20	Developing of physical models for radiofrequency systems
3. Computer-aided design and simulation of radio systems	4				3		7	20	Using software tools for computer aided simulation
4. Mathematical simulation of electrodynamics objects and processes	4				3		7	20	Using software tools for com-puter aided simulation

Total	16				12		28	80	

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Products and performance assessments	50	during semester	Grade A (excellent) - practical tasks – full done. Grade B (good) – practical tasks - well done. Grade C (good) - practical tasks - well done. Grade D (passed) - practical tasks done with mistakes. Grade E (fail) - failure in practical tasks.
Final exam	50	after module	Grade A (excellent) - clarity of expression – excellent, confident delivery. Grade B (good) – clarity of expression – good, thoughts and ideas clearly expressed. Grade C (good) - clarity of expression – well-placed, delivery is fluctuate. Grade D (passed) - clarity of expression – poor, delivery is fluctuate. Grade E (fail) - failure in theoretical tasks.

Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
Compulsory literature				
R.C. Dorf, J.A. Svoboda	2001	Introduction to electric circuits		John Wiley & Sons
T. Tuma and A. Burmen	2000	Circuit Simulation with SPICE OPUS: Theory and Practice, Modeling and Simulation Science, Engineering and Technology		Boston: Birkhäuser

YU.N. Pavlovskiy, N.V. Belotelov, YU.I. Brodskiy	2008	Imitatsionnoye modelirovaniye: uchebnoye posobiye dlya stud. vuzov		M .: Akademiya
Polyakov M.A.	2014	Guidance for laboratory work in " Simulation in radiofrequency systems" for students of specialty 172 "Radioengineering", full time study		Zaporozhye: ZNTU
Additional literature				
D'yakonov V.P.	2011	Matlab i Simulink dlya radioinzhenerov		M.: DMK Press
		Matlab's forum, examples and files exchange		https://www.mathworks.com/matlabcentral/
Romanyuk V.A., Bakhvalova S. A.	2016	Osnovy modelirovaniya i proyektirovaniya radiotekh-nicheskikh ustroystv v Microwave Office. Uchebnoye posobiye		Solon-Press