

PSUTI, RU
DESCRIPTION OF THE PROMENG Curricula/Module

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ОПИСАНИЕ PROMENG учебных программ / модулей

TITLE OF THE MODULE Название модуля	Code
Environment management and Engineering. Bases of Electromagnetic Ecology	-

Teacher(s) Учитель (я)	Department отдел
Coordinating: Координационный: Associate professor, PhD Vadim A. Ruzhnikov, Others: Другое:	«Electrodynamics and antennas»

Study cycle, Цикл обучения	Level of the module Уровень модуля	Type of the module Тип модуля
Fifth semester of third academic year		Compulsory

Form of delivery Форма внедрения	Duration Продолжительность	Langage(s) Язык
Lecture and practice	16 weeks	Russian

Prerequisites Необходимые условия	
Prerequisites: Необходимые условия	Co-requisites (if necessary): Со-реквизиты (при необходимости):

Credits of the module Кредиты модуля	Total student workload Общая учебной нагрузка студентов	Contact hours Контактные часы обучения (аудиторные)	Individual work hours Объем часов индивидуальной (самостоятельной) работы
-	136	68	68

Aim of the module (course unit): competences foreseen by the study programme Цель развития модуля (блок курса): компетенции предусмотренные учебной программой		
The purpose of the course " Environment management and Engineering. Bases of Electromagnetic Ecology » is a training and acquisition by students of basic and advanced concepts, knowledge and skills in the field of problems and methods of the electromagnetic environment.		
Learning outcomes of module (course unit) Результаты обучения модуля (блока курса)	Teaching/learning methods Методы преподавания/ обучения	Assessment methods Методы оценки
The main objectives of the course are the familiarity of students with general questions biophysical bases of the impact of electromagnetic radiation on living organisms, including humans, in a wide spectral range: gamma rays, X-rays and ultraviolet radiation, visible light, infrared radiation, radio waves.	Auditorium	Exam

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practical work	Laboratory work	Placements	Total contact work	Individual work	Tasks
Темы	Лекции	Консультации	Семинары	Практические работы	Лабораторные работы	Место размещения	Общий объем ауд. работ	Самостоятельная работа	Достижимые цели (задачи)
<p>Vvedenie. Biofizicheskie fundamentals of electromagnetic radiation on living organisms.</p> <p>The subject of the biophysical basis of electromagnetic biology. The main types of electromagnetic radiation on living organisms, including humans.</p> <p>Energy and frequency selectivity of the systems of living organisms to electromagnetic radiation.</p>	6		2					10	<p>The main objectives of the course are the familiarity of students with general questions biophysical bases of the impact of electromagnetic radiation on living organisms, including humans, in a wide spectral range: gamma rays, X-rays and ultraviolet radiation, visible light, infrared radiation, radio waves.</p>
<p>I. Biophysical effects of electromagnetic radiation on living organisms in different spectral ranges.</p> <p>Gamma radiation , its physical characteristics, features and springs. The mechanisms of interaction of gamma radiation with matter. Radiobiology . Systemic effects and biological effects of radiation. Dosimetry and biological norms . Protection against gamma radiation.</p> <p>X-radiation , its physical characteristics, features and springs. The mechanisms of interaction of X-rays with matter. X-ray radiobiology . Dosimetry and biological norms . X-ray shielding .</p> <p>Ultraviolet light , its physical characteristics, features and power . The mechanisms of interaction of ultraviolet radiation with matter. Dosimetry and biological norms . Protection from UV radiation.</p> <p>Visible light , its physical characteristics, features and springs. Mechanisms of interaction with matter and its role in the formation of the biosphere. Ritmozadayuschaya function . Biological norms .</p> <p>Infrared radiation , its physical characteristics, features and springs. Mechanisms of interaction with matter and its role in shaping the planet's climate. Biological norms .</p> <p>The radio emission in the VLF - ELF range. Experimental data on the effects of radiation in the VLF - ELF radio bands on living organisms. Possible mechanisms of action of radiation on living organisms , including humans. Biological norms .</p> <p>The radio emission in the UHF, SHF , EHF bands. The experimental data on the interaction of radiation in the UHF - ELF radio bands on living organisms , including humans. Extremely low-frequency modulation of high-frequency electromagnetic radiation in the environment. Possible mechanisms of action of radiation on living organisms possible genetic influence . Biological norms .</p> <p>Constant electric and magnetic fields . Biological effects of fields. Possible mechanisms of action of fields on living organisms , including humans. Biological norms and standards . Safety measures</p>	18			18			18		

and additional risk factors .									
<p>II. Electromagnetic fields of biological systems and their role in the regulation of the processes of life .</p> <p>The electromagnetic field of regulation in living organisms. Electromagnetic fields are the main systems of the human body , their registration , and features.</p> <p>Medical and biological aspects of external electromagnetic radiation on the operation of the main systems of the human body. Adaptation mechanisms response of living systems to electromagnetic radiation.</p> <p>The correlation characteristics of the biological and physico -chemical processes in the human body heliogeophysical factors electromagnetic nature .</p> <p>The temporal organization of biological systems and environmental factors . The rhythmic structure of the organization environment. Biorhythms.</p>	6		2		6			10	
<p>III. Environmental monitoring of the electromagnetic activity of the main systems of the human body .</p> <p>The concept of environmental electromagnetic monitoring of the main systems of the human body. Methods of recording the basic indicators of the functional systems of the human body .</p> <p>Machinery and equipment electromagnetic monitoring of major systems of the human body . Automation of measurement systems electromagnetic monitoring . Initial processing of monitoring data , compressing and storing .</p> <p>The concept of simultaneous monitoring of electromagnetic radiation environment and the basic systems of the human body .</p>	6				6			20	
Итого	36		4	20	30		136	58	10

Assessment strategy Оценка стратегии	Weight in % Доля в %	Deadlines Сроки	Assessment criteria Критерии оценки
Running control I	25	6 th week	Attendance, activity, study cases and scientific articles
Intermediate control II	20	10 th week	Writing exam
Running control II	25	12 th week	Attendance, activity, study cases and scientific articles
Final exam	30	16 th week	Writing exam

Author Автор	Year of issue Год выпуска	Title Название	No of periodic al or volume Нет издания или нужного количества	Place of printing. Printing house or intrenet link Место издания. Издание на месте или ссылка на Интернет
Compulsory literature Обязательная литература				
Сподобаев Ю.М., Кубанов В.П.	2000	Основы электромагнитной экологии		http://nilem.ru/uploads/books/electromagnitnaya_ecologiya.pdf
Additional literature Дополнительная литература				
Маслов М.Ю.,		Основы электромагнитной		

Ружников В.А.		экологии (пособие для практических занятий)		
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