

[Введите текст]

<b>Short Name of the University/Countrycode Date (Month / Year)</b>	<b>PSTU January 2019</b>
<b>TITLE OF THE MODULE</b>	<b>Code</b>
Nanostructures and nanocapsules	

<b>Teacher(s)</b>	<b>Department</b>
<b>Coordinating:</b> Dr.Oleinik I. <b>Others:</b>	Department of Material Science and New Generation Technologies

<b>Study cycle</b>	<b>Level of the module</b>	<b>Type of the module</b>
MA	10 <sup>th</sup> semester	compulsary

<b>Form of delivery</b>	<b>Duration</b>	<b>Langage(s)</b>
Lectures, seminars	17 weeks	Ukrainian

<b>Prerequisites</b>	
<b>Prerequisites:</b> Knowledge: materials engineering Skills: ability to search information Competences: team work on presentation	<b>Co-requisites (if necessary):</b> Students should have skills to work in basic computer software (eg. MS Word, MS PowerPoint)

<b>ECTS (Credits of the module)</b>	<b>Total student workload hours</b>	<b>Contact hours</b>	<b>Individual work hours</b>
3	90	51	39

<b>Aim of the module (course unit): competences foreseen by the study programmes</b>		
Students should be able to: <ul style="list-style-type: none"> <li>- Take part in a discussion on new trends in nanomaterials;</li> <li>- Find, analyze and compare information of new nanostructures;</li> <li>- Make a presentation on a selected topic.</li> </ul>		
<b>Learning outcomes of module (course unit)</b>	<b>Teaching/learning methods</b>	<b>Assessment methods</b>

[Введите текст]

<p>Knowledge:</p> <p>Knowledge of basic information of nanotechnology, various nanomaterials, nanostructures and nanocapsules, specific of nanoscale, processing methods and toxicity of nanostructures.</p> <p>Knowledge of nanostructures and nanocapsules application in bioimaging and biosensors, drug delivery systems, tissue engineering, hyperthermia, gene therapy and also bio-NEMS.</p> <p>Competences:</p> <p>Awareness of the impact of nanotechnology on people and the environment.</p>	Lectures	Open questions test
<p>Skills:</p> <p>Ability to analyze, compare and verify information on a selected topic.</p> <p>Proper project presentation.</p>	Seminar	Project in the form of presentation

Themes	Contact work hours							Time and tasks for individual work	
	Lectures	Consultations	Seminars	Practicalwork	Laboratory work	Placements	Total contactwork	Individual work	Tasks
1. Introduction, basic information on nanotechnology, nanostructures and nanocapsules, nanomaterials, specific of nanoscale, processing methods and toxicity of nanostructures. Topics of team presentations for students.	6		4				10	6	Study of theoretical material, case study
2. Carbon nanostructures and nanocapsules such as nanodiamond, fullerenes, carbon onions, carbon nanotubes, graphene, nanohorns, nanocones and nanocoils.	6		2				8	5	Study of theoretical material, case study
3. Metallic nanostructures, metallic nano-oxides, quantum dots and silica nanostructures.	4		2				6	5	Study of theoretical material, case study
4. Polymeric nanostructures and nanocapsules, micelles and liposomes.	4		2				6	5	Study of theoretical material /case study/ presentations
5. Nanostructures and nanocapsules in bioimaging.	6		2				8	5	Study of theoretical material/case study/ presentations
6. Biosensors and application of selected nanostructures and nanocapsules.	4		2				6	5	Study of theoretical material/case study/ presentations

[Введите текст]

7. Nanostructures and nanocapsules in drug delivery systems, gene therapy, hyperthermia, tissue engineering, bioMEMS and bioNEMS.	4		2					6	5	Study of theoretical material /case study/ presentations
8. Final open questions test	1							1	3	
<b>Total</b>	35		16					51	39	

Assessment strategy	Weight in %	Deadlines	Assessment criteria
Presentation	50	17 <sup>th</sup> week	Attendance, activity, presentation
Final test	50	17 <sup>th</sup> week	Open questions test

Author	Year of issue	Title	No of periodical or volume	Place of printing. Printing house or internet link
<b>Compulsory literature</b>				
Андреевский Р. А., Рагуля А. В.	2005	Наноструктурные материалы		Москва : Академия
<b>Additional literature</b>				
Jain K.K.	2017	The handbook of nanomedicine		Humana Press
Bhushan B. (Ed.)	2010	Handbook of nanotechnology		Springer
Guozhong C.	2004	Nanostructures and nanomaterials		Imperial College Press, London
Badilescu S., Packirisamy M.	2011	BioMEMS - Science and Engineering Perspectives		CRC Press
Broz P. (Ed.)	2010	Polymer-based nanostructures - medical application		RSC Publishing, Cambridge
Khanna V.K.	2012	Nanosensors: physical, chemical and biological		CRC Press
Ramakrishna S., Ramalingam M., Kumar T.S.S., Soboyejo W.O.	2010	Biomaterials. A nano approach		CRC Press

[Введите текст]

Barreto J.A., O'Malley W., Kubeil M., Graham B., Stephan H., Spiccia L.	2011	Nanomaterials: applications in cancer imaging and therapy	23: 1419–1471	Advanced Healthcare Materials
Gogotsi Yury	2006	<u>Nanomaterials</u>		CRC Press
Головин Ю. И.	2012	Основы нанотехнологии		Москва : Машиностроение
Пул Ч., Оуэнс Ф. (перевод с англ. под ред. Ю. И. Головина)	2012	Нанотехнологии		Москва : Техносфера