AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Module name: Smart polymers

Academic year: 2019/2020 Code: ZSDA-3-0115-s ECTS credits: 3

Faculty of: Szkoła Doktorska AGH

Field of study: Szkoła Doktorska AGH Specialty: —

Study level: Third-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 0

Course homepage: —

Responsible teacher: prof. dr hab. inż. Hasik Magdalena (mhasik@agh.edu.pl)

Module summary

During the course students acquire knowledge on the most important classes of smart, i.e. stimuli-responsive polymers.

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	Student is aware of her/his role in the community as a researcher setting new trends in the studies of polymeric materials.	SDA3A_K01, SDA3A_K03, SDA3A_K02	Activity during classes
Skills: he can			
M_U001	Student is able to select/develop a stimuli-responsive polymeric or polymer-based material for a given application.	SDA3A_U07, SDA3A_U06, SDA3A_U02, SDA3A_U05, SDA3A_U01	Activity during classes
M_U002	Student can find the scintific literature on the topic of interest to her/him and critically analyse its contents.	SDA3A_U07, SDA3A_U05, SDA3A_U01	Activity during classes
Knowledge: he knows and understands			
M_W001	Student has the knowledge on the structure, classification, synthetis and characterization methods as well as properties of macromolecular compounds.	SDA3A_W03, SDA3A_W02, SDA3A_W01	Test

M_W002	Student knows the types, methods of synthesis, characterization, applications of stimuli-responsive polymers and is familiar with new trends in their studies.	SDA3A_W03, SDA3A_W02, SDA3A_W07, SDA3A_W06	Test

Number of hours for each form of classes

	Form of classes										
Suma	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
35	20	0	0	0	0	15	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	Student is aware of her/his role in the community as a researcher setting new trends in the studies of polymeric materials.	+	-	-	-	-	+	-	-	-	-	-
Skills: he can												
M_U001	Student is able to select/develop a stimuli-responsive polymeric or polymer-based material for a given application.	+	-	-	-	-	+	-	-	-	-	-
M_U002	Student can find the scintific literature on the topic of interest to her/him and critically analyse its contents.	+	-	-	-	-	+	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	Student has the knowledge on the structure, classification, synthetis and characterization methods as well as properties of macromolecular compounds.	+	-	-	-	-	+	-	-	-	-	-

M_W002	Student knows the types, methods of synthesis, characterization, applications of stimuli-responsive polymers and is familiar with new trends in their studies.	+	-	-	-	-	+	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	35 h
Preparation for classes	10 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	10 h
Realization of independently performed tasks	10 h
Examination or Final test	2 h
Summary student workload	67 h
Module ECTS credits	3 ECTS

Additional information

Module content

Lectures

At the beginning of the course, its participants are introduced to the main characteristic features of the structure, to the classification, synthesis and processing of macromolecular compounds. Then various types of stimuli-responsive polymers are discussed. They include shape-memory polymers, self-healing polymers, self-assembly/supramolecular polymers and polymer-based responsive nanostructured materials. The course covers aspects of synthesis, characterization and applications of such materials.

Seminar classes

Each participant of the course has to prepare a multimedia presentation on a topic related to one of those discussed during the lectures.

Teaching methods and techniques:

Lectures: Multimedia presentations, combined (when necessary) with elements of a conventional lecture.
Seminar classes: Multimedia presentations prepared by the students.

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

At the end of term, students will have to pass the test covering all the topics discussed in the lectures. The test grade will be the lecture grade.
Seminar classes grade will be based on the student’s presentation grade and student’s acivity during the classes.

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:
– Attendance is mandatory: Yes
– Participation rules in classes: Attendance in the lectures is mandatory.
Seminar classes:
– Attendance is mandatory: Yes
– Participation rules in classes: Attendance in the classes is compulsory.

Method of calculating the final grade

Final grade is the arithmetic mean of the lecture grade and seminar classes grade.

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:

Each case will be considered individually.

Prerequisites and additional requirements

none

Recommended literature and teaching resources

1) F. W. Billmeyer “Textbook of polymer science”, John Wiley & Sons (any edition)
2) Scientific papers and published conference proceedings

Scientific publications of module course instructors related to the topic of the module

Publications of the module course instructor can be found at the following website: http://www.bg.agh.edu.pl/node/688.

Additional information

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