

# LEARNING MODULE DESCRIPTION

## GENERAL INFORMATION

1. Module title: **Preparation and Application of Colloids**
2. Module code: **PDaPT**
3. Programme title: **Chemistry**
4. Cycle of studies: **3<sup>rd</sup> semester**
5. Year of studies (where relevant): **second year**
6. Terms in which taught (summer/winter term): **summer**
7. Type of classes and the number of contact hours: **Lecture: 15 hrs, laboratory: 30 hrs**
8. Number of ECTS credits: **5**
9. Name, surname, academic degree/title of the module lecturer/other teaching staff/ e-mail: Module lecturer: **prof. Bartosz Tylkowski, bartosz.tylkowski@urv.cat**
10. Language: **English**

## DETAILED INFORMATION

1. Module aim (aims)

This module will introduce colloid sciences, based on the application of the principles of physical chemistry. Early lectures will assume only an elementary knowledge of physical chemistry and they will provide the basis for more thorough discussion in later lectures covering specific aspects of colloid science. The widespread occurrence of colloids is stressed and the more important industrial applications of colloid technology will be outlined. The final lectures will deal with the future of colloid science and indicates the directions in which further developments are likely to take place.

## READING LIST

1. B. Jirgensons and M. E. Straumanis, A Short Textbook of Colloid Chemistry (Second Edition), ISBN: 978-0-08-009601-8
2. L. Schramm, Dictionary of Nanotechnology, Colloid and Interface Science, ISBN103527322035
3. L. Schramm, Surfactants : Fundamentals and Applications in the Petroleum Industry, ISBN10 0521157935
4. W. Norde, Colloids and Interfaces in Life Sciences and Bionanotechnology, ISBN101439817189

## SYLLABUS:

### Lecture

Issue 1: What are Colloids?

Issue 2: Why are Colloidal Dispersions Stable? I Basic Principles

- Issue 3: Why are Colloidal Dispersions Stable? II Interparticle Forces  
 Issue 4: How are Colloidal Dispersions Prepared?  
 Issue 5: What is the Role of Surface Chemistry? Surface Tension and Adsorption  
 Issue 6: Some Important Properties of Colloids – Part I  
 Issue 7: Some Important Properties of Colloids – Part II  
 Issue 8: How are Colloidal Dispersions Destroyed? I Aggregation Processes  
 Issue 9: How are Colloidal Dispersions Destroyed? II Coalescence and Particle Growth  
 Issue 10: Association Colloids and Self-Assembly Systems  
 Issue 11: Thin Films and Foams,  
 Issue 12: Gels and Emulsions  
 Issue 13: The Industrial Importance of Colloids – Part I  
 Issue 14: The Industrial Importance of Colloids – Part II  
 Issue 15: The Future of Colloid Science

### STUDENT WORKLOAD (ECTS credits)

Module title:	
Activity types	Mean number of hours* spent on each activity type
Contact hours with the teacher as specified in the programme	45
Preparation for laboratory project	20
Study of the results from laboratory	15
Reading of the indicated literature	10
Writing of the reports	15
Preparation for exam	20
<b>Total hours</b>	<b>125</b>
<b>Total ECTS credits for the module</b>	<b>5</b>

\* Class hours – 1 hour means 45 minutes

#Independent study – examples of activity types: (1) preparation for classes, (2) data analysis, (3) library-based work, (4) writing a class report, (5) exam preparation, etc.

### GRADING SYSTEM:

5	EXCELLENT – outstanding performance	(91-100%)
4+	VERY GOOD – above the average standard with only minor errors	(81-90%)
4	GOOD – generally sound work with some minor errors	(71-80%)
3+	SATISFACTORY – fair but with a number of notable errors	(61-70%)
3	SUFFICIENT – fair but with significant shortcomings	(51-60%)
2	FAIL	below 51%