

# Course description

<b>Course abbreviation:</b>	KCH/CHVYP	<b>Page:</b>	1 / 3
<b>Course name:</b>	Chemistry Calculations		
<b>Academic Year:</b>	2016/2017	<b>Printed:</b>	20.07.2019 05:12

<b>Department/Unit /</b>	KCH / CHVYP	<b>Academic Year</b>	2016/2017
<b>Title</b>	Chemistry Calculations	<b>Type of completion</b>	Pre-Exam Credit
<b>Accredited/Credits</b>	Yes, 4 Cred.	<b>Type of completion</b>	Oral
<b>Number of hours</b>	Seminář 2 [Hours/Week]		
<b>Occ/max</b>	Status A      Status B      Status C	<b>Course credit prior to</b>	NO
<b>Summer semester</b>	0 / -      0 / -      0 / -	<b>Counted into average</b>	NO
<b>Winter semester</b>	19 / -      10 / -      0 / 0	<b>Min. (B+C) students</b>	not determined
<b>Timetable</b>	Yes	<b>Repeated registration</b>	NO
<b>Language of instruction</b>	Czech	<b>Semester taught</b>	Winter semester
<b>Substituted course</b>	None	<b>Internship duration</b>	0
<b>Preclusive courses</b>	N/A		
<b>Prerequisite</b>	N/A		
<b>Informally recommended courses</b>	N/A		
<b>Courses depending on this Course</b>	KCH/DIPS1		

## Course objectives:

### Aims

In the course, the students familiarize with the basic types of the chemical calculations and they exercise them in the actual examples from the laboratory practice.

## Requirements on student

### Requirements

Condition of the credits awarding is a gain of 75 % from the total summary of three partial tests. In the case of a lower gain, there is a possibility to write one correcting test from the total content of the course with minimum gain 75 % from the total point evaluation.

Knowledge of the secondary-school chemistry.

Evaluation of the subject as well as the exam grading is made according to the articles No 31 - 33 in the Regulations on Study and Examinations University of Ostrava

## Content

### Content

1. The basic chemical nomenclature
2. Calculations of molar weight, mass amount, Avogadro's constant, atomic mass constant
3. Calculations from the chemical formulas, determination of the empirical and molecular formula
4. Test 1, Formulation of the solutions compositions - weight and volume fraction
5. Formulation of the solutions compositions - mass concentration, molar fraction, molality, weight concentration.
6. The mutual re-calculation of concentrations, solubility and crystallization
7. Arrangement and numbering of the chemical equations
8. Test 2, Calculations from the chemical equations
9. Calculations with use of laws for ideal gas, equation of the ideal gas state
10. Dissociation of electrolytes, dissociation of water, pH and pOH calculations, dissociation of the aqueous solutions
11. Practising of examples with use of combination of the various type calculations
12. Test 3, Practising of examples with use of combination of the various type calculations
13. Credit, correcting test.

**Prerequisites - other information about course preconditions**

none

**Competences acquired**

## Competences

The students know the basic relations, formulas and calculation methods used in chemistry. They can calculate from the chemical formulas; they can calculate the empirical and molecular formula. They are able to formulate the solutions compositions by various ways and execute calculations connected with solutions. They understand calculations connected with ideal gas and equation of state. They acquired calculations connected with acidobasic equilibria, they can orientate in the relevant special literature.

**Fields of study****Guarantors and lecturers**

- **Guarantors:** doc. RNDr. Roman Maršálek, Ph.D.
- **Seminar lecturer:** doc. RNDr. Roman Maršálek, Ph.D.

**Literature**

- **Basic:** TRŽIL, J., ULLRYCH, J., SLOVÁK, V. *Příklady z chemie*. VŠB-TU Ostrava, 1999. ISBN 80-7078-252-8.
- **Basic:** KORBAČKOVÁ, D. *Vybrané příklady z obecné a anorganické chemie*. PdF Ostrava, 1987.
- **Extending:** P.W. Atkins, C.A. Trap. *Solution Manual for Physical Chemistry, 5th edition*. Oxford, 1994.
- **Recommended:** GAŽO, J., et al. *Anorganická chémia - Laboratorne cvičenia a výpočty 3. nezmenené vydanie*. Alfa Bratislava, 1980.
- **Recommended:** MARKO, M., HORVÁTH, S., KANDRÁČ, J. *Příklady a úlohy z chemie*. SPN Praha, 1978.
- **Recommended:** NOVOTNÝ, V., JEŘÁBEK, B., HOZA, V. *Sbírka příkladů a úloh z chemie*. SNTL Praha, 1988. ISBN 04-415-88.

**Time requirements**

Activities	Time requirements for activity [h]
Being present in classes	26
Self-tutoring	39
Preparation for test	35
<b>Total:</b>	<b>100</b>

**assessment methods****Knowledge**

- Continuous analysis of student's achievements
- Written examination

**teaching methods****Knowledge**

- Briefing
- Working with text (coursebook, book)

**learning outcomes****Knowledge - knowledge resulting from the course:**

## Competences

The students know the basic relations, formulas and calculation methods used in chemistry. They can calculate from the chemical formulas; they can calculate the empirical and molecular formula. They are able to formulate the solutions compositions by various ways and execute calculations connected with solutions. They understand calculations connected with ideal gas and equation of state. They acquired calculations connected with acidobasic equilibria, they can orientate in the

relevant special literature.

**Course is included in study programmes:**

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Chemistry	Bachelor	Full-time	Chemistry	1	2012	2016	Povinné předměty	A	1	ZS
Chemistry	Bachelor	Full-time	Chemistry with Other Degree Specialization	1	2	2016	Povinně volitelné předměty	B	1	ZS
Chemistry	Bachelor	Full-time	Chemistry with Other Degree Specialization	1	2014	2016	Povinně volitelné předměty	B	1	ZS
Physics	Bachelor	Full-time	Chemistry with Other Degree Specialization	1	2014	2016	Povinně volitelné předměty	B	1	ZS