**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚCHV/ ADP/03 | **Course name:** Porous materials and their applications |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** I., II., III.

**Prerequisities:**

**Conditions for course completion:**
Written test in the middle and the end of the semester.

**Learning outcomes:**
To make the acquaintance of various types of advanced porous solids and basic methods for their investigation. To gen up the students with the methods used in characterisation of specific surface area and pore size of different types of porous materials.

**Brief outline of the course:**
Terminology and principal terms associated with powders, porous solids and adsorption. Methodology of adsorption at the gas-solid interface, liquid-solid interface. Assessment of surface area and porosity. Inorganic materials (active carbon, metal oxides, zeolites, clay minerals, new advanced materials) and phenomenon of adsorption. Application in the industry and everyday life.

**Recommended literature:**
1. F. Rouquerol, J. Rouquerol, K. Sing: Adsorption by powders and porous solids, Academic press, London, UK, 1999
2. S. J. Gregg, K.S.W. Sing: Adsorption, surface area and porosity, Academic Press, London,, UK, 1982.
3. V. Zeleňák: Adsorption and porosity of solid substances, internal study text, PF UPJŠ, 2007.

**Course language:**

**Course assessment**
Total number of assessed students: 78

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 78.21 | 11.54 | 2.56 | 0.0 | 0.0 | 0.0 | 0.0 | 7.69 |

**Provides:** prof. RNDr. Vladimír Zeleňák, PhD.

**Date of last modification:** 26.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** CJP/ AJD1/07 | **Course name:** English Language for PhD Students 1 |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 1.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 558

| N | Ne | P | Pr | abs | neabs |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 56.99 | 0.0 | 43.01 | 0.0 |

**Provides:** PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD., Mgr. Zuzana Naďová

**Date of last modification:** 06.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** CJP/ AJD2/07 | **Course name:** English Language for PhD Students 2 |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 2.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 558

| N | Ne | P | Pr | abs | neabs |
|---|---|---|---|---|---|
| 0.0 | 0.0 | 92.29 | 1.43 | 6.27 | 0.0 |

**Provides:** PhDr. Helena Petruňová, CSc., Mgr. Zuzana Kolaříková, PhD.

**Date of last modification:** 06.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ CDC/04 | **Course name:** Citation in scientific journal published in the country of residence |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| abs | n |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ CM/04 | **Course name:** Citation in monograph |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 1 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚCHV/ CNM/15 | **Course name:** Chemistry of nanomaterials |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 21

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 71.43 | 19.05 | 9.52 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** prof. RNDr. Vladimír Zeleňák, PhD.

**Date of last modification:** 26.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ CZC/04 | **Course name:** Citation in scientific journal published abroad |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 10 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 40 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ DDS/12 | **Course name:** Domain and domain walls |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 1 **Per study period:** 14
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Exam

**Learning outcomes:**
The objective is to acquaint the students witrh the basis of the domain and domain wall formation, their structure, static and dynamic properties in magnetic materials.

**Brief outline of the course:**
Domain structure. Experimental study of domain structure. Calculation of domain structure. Anisotropies. Domain wall types. Domain wall potential. Domain wall dynamics. Domain wall motion induced by electrical current.

**Recommended literature:**
1. B.D. Cullity, C.D. Graham, „Introduction to magnetic materials“, John Wiley & Sons, New Jersy (2009)
2. S. Chikazumi, Physics of Ferromagnetism, Oxford University Press, USA (2009)
3. S. Tumanski, Handbook of Magnetic Measurements, CRC Press (2011)
4. N. A. Spaldin, Magnetic Materials: Fundamentals and Device Applications, Cambridge University Press ( 2003)

**Course language:**
slovak or english

**Course assessment**
Total number of assessed students: 3

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:** prof. RNDr. Rastislav Varga, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ DK/04 | **Course name:** National Conference |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 125 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ DKC/04 | **Course name:** Journals registered in the Current Contents Connect database and published in the country of residence |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 15 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 7 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ DKZU/04 | **Course name:** Home Conference with Foreign Participation |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 4 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 255 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ DNC/04 | **Course name:** Journals not registered in the Current Contents Connect database and published in the country of residence |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 13 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ DZS/14 | **Course name:** Doctoral Thesis Examination |
|---|---|

**Course type, scope and the method:**
**Course type:**
**Recommended course-load (hours):**
**Per week: Per study period:**
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:**

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Obtaining required number of credits as given by the study plan.

**Learning outcomes:**
Evaluation of competences of the student according to his/her scientific profile.

**Brief outline of the course:**
Presentation of the results in the thesis for disertation exam, responding to referee´s comments, answering questions of exam committee. Two questions are selected subsequently from one compulsory and one optional subject, respectively. The subjects are selected by guarantee of the program according to the study plan and scientific profile of the student. The third question addresses the current state of work on dissertation thesis.

**Recommended literature:**

**Course language:**
english

**Course assessment**
Total number of assessed students: 94

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:**

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ FCVM1/13 | **Course name:** Physical and chemical properties of materials I |

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
50% - written test
50% - ppt project from selected topic oriented on thessis

**Learning outcomes:**
To obtain knowledges about new trends in material production, about their characterisation and advanced research in Materials Science with priority for their application.

**Brief outline of the course:**
Structure of pure metals, solid solutions, intermetalic compounds. Thermodynamics in metalurgy. Phase diagrams. Difusion in metals and compounds. Phase transformation - solidification and precipitation. Physical metalurgy of steels. Electrochemical deposition of thin films and their characterization. Methods of elektrochemical deposition of metallic thin films. Nanomaterials and their unique physical and chemical properties. Classification of nanomaterials in the view of space orrganization and preparation. Methods of nanomaterial synthesis. Nanoporous materials and their properties.

**Recommended literature:**
1. R.W. Cahn and P. Haasen, Physical Metalurgy, ISBN 0 444 86786 4 part I, NHPandC, 1983.
2. M.A. White, Physical Properties of Materials, CRC Press 2012, ISBN:978-1-4398-6651-1
3. R. Oganov, Modern Methods of Crystal structure Prediction, Wiley-VCH, 2011, ISBN: 978-3-527-40939-6.
4. M.A.Mayers et al: Nano and Microstructural Design of Advanced Materials, Elsevier 2003, ISBN:0-08-044373-7.

**Course language:**
english

**Notes:**
During exercise will be used the most modern research infrastructure solutions purchased for scientific projects.

**Course assessment**
Total number of assessed students: 24

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:** prof. RNDr. Pavol Sovák, CSc., Ing. Karel Saksl, DrSc., prof. RNDr. Vladimír Zeleňák, PhD., doc. RNDr. Adriana Zeleňáková, PhD.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ FCVM2/13 | **Course name:** Physical and chemical properties of materials II |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
50% - written test
50% - ppt presentation from selected topic, oriented on thessis

**Learning outcomes:**
To obtain knowledges about mechanical, physical and chemical properties of advanced materials.

**Brief outline of the course:**
Elements of microstructure: point defects, dislocations and stacking faults, High-angle grain boudaries, Small -angle boundaries. Interfaces, antiphase boundaries. Developement of microstructure. Plastic deformation and deformation stenthening. Hardening: solid-solution, precipitation. Recrystallisation and hot working. Methods of thermal analysis. Texture and methods for characterisation.Metallic and nonmetallic nanoporous materials and their properties. Nanoparticles and their applications. Physico-chemical properties of nanoparticles and their experimental study.

**Recommended literature:**
1. R.W. Cahn and P. Haasen, Physical Metalurgy, ISBN 0 444 86786 4 part I, NHPandC, 1983.
2. M.A. White, Physical Properties of Materials, CRC Press 2012, ISBN:978-1-4398-6651-1
3. R. Oganov, Modern Methods of Crystal structure Prediction, Wiley-VCH, 2011, ISBN: 978-3-527-40939-6.
4. M.A.Mayers et al: Nano and Microstructural Design of Advanced Materials, Elsevier 2003, ISBN:0-08-044373-7.

**Course language:**
english

**Notes:**
During exercise will be used the most modern research infrastructure solutions purchased for scientific projects.

**Course assessment**
Total number of assessed students: 24

| N | P |
|---|---|
| 0.0 | 100.0 |
| **Provides:** prof. RNDr. Pavol Sovák, CSc., Ing. Karel Saksl, DrSc., doc. RNDr. Adriana Zeleňáková, PhD., prof. RNDr. Vladimír Zeleňák, PhD. | |
| **Date of last modification:** 01.03.2018 | |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. | |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/FMJ/06 | **Course name:** Physics of Magnetic Phenomena |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** I., III.

**Prerequisities:**

**Conditions for course completion:**
Exam

**Learning outcomes:**
The aim of the subject is to give overview to the physical mechanism of the magnetization process.

**Brief outline of the course:**
Basic units for magnetic material characterization. Magnetic materials. Magnetic anisotropies. Magnetic parameters. Domain structure. Magnetization processes. Dynamics of magnetization processes.

**Recommended literature:**
1; B.D. Cullity and C.D. Graham, Introduction to magnetic materials, Willey-IEEE Press, 2007
2; S. Chikazumi, Physics of Ferromagnetism, Claredon Press, 1997
3; C.W. Chen, Magnetism and metallurgy of soft magnetic materials, Dover Publ.,1986

**Course language:**
slovak or english

**Course assessment**
Total number of assessed students: 61

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 62.3 | 4.92 | 1.64 | 1.64 | 0.0 | 0.0 | 0.0 | 29.51 |

**Provides:** prof. RNDr. Rastislav Varga, DrSc.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ IG/04 | **Course name:** Acquirement of Internal Grant |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 10 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 105 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** Dek. PF UPJŠ/JSD/14 | **Course name:** Spring School for PhD Students |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week: Per study period:** 4d
**Course method:** present

**Number of credits:** 2

**Recommended semester/trimester of the course:**

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 121

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** prof. RNDr. Katarína Cechlárová, DrSc.

**Date of last modification:** 19.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ KEM/14 | **Course name:** Ceramics Materials |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Test,
Examination

**Learning outcomes:**
The main aim of this course is to gain confidence in the preparation and properties of a wide range of ceramics and their applications.

**Brief outline of the course:**
Introduction to Solid State Science. The Fabrication of Ceramics. Construction Ceramics. Mechanical Properties of Construction Ceramics. Ceramics Conductors. Dielectrics and Insulators. Piezoeletrics Ceramics. Pyroelectric Materials. Electro-optic Ceramics. Magnetic Ceramics. Aplications of Ceramics Materials in a Modern Idustry.

**Recommended literature:**
1. Moulson A.J., Herbert J.M.: Electroceramics, Chapman and Hall, London, 1990.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 0

| N | P |
|---|---|
| 0.0 | 0.0 |

**Provides:** doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzer, PhD.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ MK/04 | **Course name:** International Conference |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 6 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 354 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

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|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MKL/03 | **Course name:** Magnetic Properties of Solids |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 4 **Per study period:** 56
**Course method:** present

**Number of credits:** 6

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**
Test.
Oral examination.

**Learning outcomes:**
To obtain a general view on basic magnetic phenomena, intrinsic magnetic properties of various magnetic materials, magnetization processes and domain structure.

**Brief outline of the course:**
Magnetic materials and magnetization. Magnetic quantities. Carriers of magnetic moment. Vector model of the atom. Magnetic field sources. Measurements of magnetic field. Diamagnetism. Paramagnetism. Ferromagnetism. Antiferromagnetism. Ferrimagnetism. Mgnetic behavior and structure of materials. Neutron diffraction. Magnetic anisotropy. Hall effect, magnetoresistance. Domain structure. Magnetostriction. Technical magnetization. Dynamic magnetization processes. Susceptibility. Thin films.

**Recommended literature:**
S. Chikazumi: Physics of Magnetism, Oxford University Press 2009
D. Jiles: Introduction to magnetism and magnetic materials, Chapman&Hall, London, New York, Tokyo, Melbourne, Madras, 1991

**Course language:**
english

**Course assessment**
Total number of assessed students: 96

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 39.58 | 17.71 | 10.42 | 3.13 | 2.08 | 0.0 | 0.0 | 27.08 |

**Provides:** prof. RNDr. Peter Kollár, DrSc.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MMTL/04 | **Course name:** Modern Methods of Solids Structure Investigation |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** III.

**Prerequisities:** ÚFV/MSA1/03

**Conditions for course completion:**
75% written test
25% the ppt presentation from selected topic

**Learning outcomes:**
To obtain knowledges about frontier microskopic techniques and XRD techniques for structural analysis of materials.

**Brief outline of the course:**
New trends in Optic microscopy, Electron microscopy, Electron diffraction. Electron microprobe analysis: WDX spectrometer, EDX spectrometer, Auger spectroscopy. Self-emision microscopy. Modern electron diffracion methods (CBD, nanodiffraction), X-ray diffractometry, phase and profile analysis. Synchrotron radion: sources and application of SR in material science research, neutron scattering , Small angle scattering. Modern methods of surface observation: STM, AFM. Synchrotron radiation in material science research.

**Recommended literature:**
1.S. Amelincks, D.van Dyck, J. van Landyut, Electron Microscopy – Principles and Fundamentals, VCH, 1997.
2.M.H. Loretto, Electrom beam analysis of materials. Springer, 2002.
3.Fundamentals of Powder Diffraction and Structural Characterization of Materials, Vitalij K. Pecharsky & Peter Y. Zavalij , Kluwer Academic Publishers, 2003.
4.Structure Determination from Powder Diffraction Data, Edited by W.I.F. David, K. Shankland, L.B. McCusker, C. Bärlocher, Oxford University Press, 2006

**Course language:**
English

**Course assessment**
Total number of assessed students: 62

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:** prof. RNDr. Pavol Sovák, CSc., Ing. Karel Saksl, DrSc.

| |
|---|
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MNK/17 | **Course name:** Mechanika kontinua |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 0 **Per study period:** 28 / 0
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:**

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
This course follows the basics of continuum mechanics presented within Theoretical mechanics in order to focus on more advanced problems of continuum mechanics. The main objective of this course is to provide an introduction to the continuum mechanics, where mechanical properties of materials are modeled as continuous mass rather than as discrete particles.

**Brief outline of the course:**
Approximation of continuum nature of matter assumes that the substance of the object completely fills the space it occupies. Such consideration ignores the fact that matter is made of atoms, completely ignoring its microphysical structure. However, on lengths scales much greater than that of interatomic distances, such models are highly accurate. Fundamental physical laws such as the conservation of mass, the conservation of momentum, and the conservation of energy may be applied to such models to derive differential equations describing the behavior of solids and liquids within the frame of continuous mechanics. At the beginning of the course, a brief introduction to the mathematical apparatus of the continuum mechanics is provided. Next, deformation of solids and classical theory of elasticity are studied. Hook law and dynamical equation of isotropic homogeneous media will be evaluated. Within the frame of continuum mechanics, a propagation of waves in unlimited media will be studied (transverse and longitudinal modes) and equations of wave propagation for geometrically confined solids (wave reflection, Rayleigh waves). Equations of free and forced oscillations of strings, membranes rods will be evaluated. Finally, basic equations of mechanics of liquids will be evaluated.

**Recommended literature:**
1. M. Brdlička, L. Samek, B. Sopko, Mechanika kontinua, Praha : Academia, 2011. 878 s. ISBN 978-80-200-2039-0.
2. M. Okrouhlík, C. Höschl, J. Plešek, S. Pták, J. Nadrchal, Mechanika poddajných těles,numerická matematika a superpočítače, Ústav termomechaniky AV ČR, 1997.
3. G.A.Holzapfel: Nonlinear Solid Mechanics, Wiley, 2000.

**Course language:**

**Course assessment**
Total number of assessed students: 0

| abs | n |
| --- | --- |
| 0.0 | 0.0 |
| **Provides:** RNDr. Kornel Richter, PhD. | |
| **Date of last modification:** 01.03.2018 | |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. | |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ MSA1/03 | **Course name:** Methods of Structural Analysis |

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 3 / 2 **Per study period:** 42 / 28
**Course method:** present

**Number of credits:** 7

**Recommended semester/trimester of the course:** 2.

**Course level:** I., II., III.

**Prerequisities:**

**Conditions for course completion:**
Final written exams form both topics:EM and X-ray diffractometry - 25%
Experimental projects from both topics: ligt and electron microscopy and X-ray diffractometry - 75%

**Learning outcomes:**
The course is oriented on modern methods of structural analysis of metals. Main topics are: optic microscopy, electron microscopy (TEM, SEM),electron microprobe analysis and X-ray diffractometry.

**Brief outline of the course:**
Optic microscopy. Electron microscopy: Electron beam instruments, Electron optics, Electron lences and deflection systems, Transmission electron microscopy - principle and construction. Electron – specimen interactions. Electron diffraction. Kikuchy lines. Scanning electron microscopy – principle and cnstrucion. Scanning transmission electron microscopy. High Voltage electron microscopy. Electron microprobe analysis: WDX spectrometer, EDX spectrometer, Auger electron spectrometer. Self-emision microscopy. Convergent beam diffraction.
X-ray diffractometry: Scattering of x-rays, Neutrons and neutron scattering, CW - diffractometer, Ewald´s sphere, Diffraction on powder samples, The main characteristics of powder diffraction pattern, Structure factor, Ocupation factor, Atomic displacement factor, Peak intensity, shape and symmetry, Sherrer equation. Peak profile, Rietweld method. Qualitative phase analysis, parameters of elementary cell, Profile analysis of diffraction peak and interpretation of profile analysis.

**Recommended literature:**
1.S. Amelincks, D.van Dyck, J. van Landyut, Electron Microscopy – Principles and Fundamentals of Electon Microscopy, VCH, 1997.
2.M.H. Loretto, Electrom beam analysis of materials. Springer, 2002.
3.Fundamentals of Powder Diffraction and Structural Characterization of Materials, Vitalij K. Pecharsky & Peter Y. Zavalij , Kluwer Academic Publishers, 2003.
4.Structure Determination from Powder Diffraction Data, Edited by W.I.F. David, K. Shankland, L.B. McCusker, C. Bärlocher, Oxford University Press, 2006

**Course language:**
English

**Course assessment**
Total number of assessed students: 65

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 36.92 | 26.15 | 10.77 | 1.54 | 0.0 | 0.0 | 0.0 | 24.62 |

**Provides:** prof. RNDr. Pavol Sovák, CSc., Ing. Karel Saksl, DrSc., Ing. Vladimír Girman, PhD.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ MVV1/07 | **Course name:** Magnetic Materials |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
test and oral examination.

**Learning outcomes:**
To obtain a general view on the magnetic properties an application of soft and hard magnetic materials.

**Brief outline of the course:**
Magnetic properties of iron, cobalt and nickel and alloys. Magnetic properties of Fe-Si steels (oriented and non-oriented). Structure and magnetic properties af amorphous and nanocrystalline alloys. Magnetic properties of permanent magnets. The principle of magnetic recording and magnetic recording media. Preparation, structure and magnetic properties of thin films and multilayers.

**Recommended literature:**
S. Chikazumi: Physics of Magnetism, J.Willey and Sons, Inc. New York, London, Sydney, 1997.
D. Jiles: Introduction to magnetism and magnetic materials, Chapman&Hall, London, New York, Tokyo, Melbourne, Madras, 1991
R. C. O'Handley: Modern Magnetic Materials, Principles and Applications, J.Willey and Sons, Inc. New York, 1999

**Course language:**

**Course assessment**
Total number of assessed students: 33

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:** doc. RNDr. Ján Füzer, PhD., RNDr. Ivan Škorvánek, CSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ NANO/09 | **Course name:** Nanomaterials and Nanotechnologies |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 4

**Recommended semester/trimester of the course:** 2.

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**
Test or preparation of the ppt presentation on a selected topic in the field of nanomaterials.

**Learning outcomes:**
To acquaint students with the basic concepts of nanotechnology and to bring them knowledge about physical and chemical properties of nanomaterials. Provide students with a comprehensive view of the wide applications using nanomaterials.

**Brief outline of the course:**

**Recommended literature:**
1. Nanoscience and nanotechnologies, The Royal Society, London 2004.
2. C. Burda, X. Chen, et al., Chemical Review 105, (2005) 1025-1102.
3. J. A. Mydosh, Spin glasses, Taylor and Francis 1993.

**Course language:**

**Notes:**
During the course will be presented also the latest scientific results about nanomaterials obtained during the research project
APVV-0132-11 (Unconventional quantum states in nanoscopic magnetic systems)
APVV-0073-14 (magnetocaloric effect in quantum and nanoscopic systems)
VEGA 1/0861/12 (The effect of the interaction of particles in the ferromagnetic iron-based magnetic properties of the composite material), VEGA-1/0377/16
workplaced in KFKL, UFV, PF UPJŠ.
During exercise will be used the most modern research infrastructure solutions purchased for scientific projects.

**Course assessment**
Total number of assessed students: 30

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 43.33 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 56.67 |

**Provides:** doc. RNDr. Adriana Zeleňáková, PhD.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ NKM1/99 | **Course name:** Non-Conventionals Metallic Materials |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**
The exam consists of writing three questions and an oral answers.

**Learning outcomes:**
The course gives information about basics of materials science, standard and advanced materials, and relations between structure states and mechanical and physical properties of metalic alloys.

**Brief outline of the course:**
Real metalic structures, Binary diagrams, Lattice imperfections, hyperstructures, Streghtening mechanisms, Precipitation and segregation processes, Defomation mechanisms, Crystallization. Fe - based alloys, advanced high-strenght alloys. Metallic biomaterials. Corrosive processes and materials for corrosion environment. Ti, Al, Co, Ni - based progressive materials. Materials dedicated to automotive, aircraft, armament and nuclear industry. Superplasticity, shape memory effect and its alloys. Materials for cryogenic applications. Intermetallics. Quasicrystals. High entropy alloys. Biodegradable metals. Metallic glasses.

**Recommended literature:**
1.D.R.Askeland and P.P. Phulé, The Science and Engineering of Materials, Thomson 2003.
2.Structure and Properties of Engineering Alloys, McGraw-Hill Editons, 1993.
Š. Nižník: Základy Fyziky tuhých látok, Učebné texty, Košice, 2002
M. Fujda: Základné rovnovážne diagramy, Učebné texty, košice, 2010

**Course language:**
Slovak language

**Notes:**
None.

**Course assessment**
Total number of assessed students: 23

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 26.09 | 17.39 | 0.0 | 4.35 | 4.35 | 0.0 | 0.0 | 47.83 |

**Provides:** Ing. Vladimír Girman, PhD.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ NSM/12 | **Course name:** Processing, properties and applications of nanomaterials |

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Final written test: 50%
The ppt presentation from selected topic:50%

**Learning outcomes:**
To obtain the newest information about processing of nanostructured materials. To use concrete examples of nanostructured materials for documentation of their unique properties and also to indicate their possibilities for applications in real technical practise.

**Brief outline of the course:**
Processing of magnetic nanomaterials using litography methods. Production and properties of thin films and multilayers. Processing of nanocrystalline metals, alloys and composites by electrodeposition. Diffusion in nanocrystalline materials: modelling of interface diffusion, specific aspects, correlation between diffusion and grain boundaries, selected examples of diffusion. Magnetic nanoparticles and their applications, fundamental physics of nanoparticles: bulk feromagnetism, magnetic clusters, molecular magnetism, ideal monodomain particle, surface and interface effects, exchange interactions between nanoparticles. Magnetic properties of some nanosystems: amorphous Fe-M-B alloys, FINEMET, influence of atomic substitutions on properties of FINEMET based alloys, Fe-Zr-Nb-B alloys, Fe-Nb-B-P-Cu alloys produced in atmosphere, influence of grain size on Currie temperature and on volume fraction of amorphous matrix. Mechanical properties of NCM: models and computer simulations of mechanical behaviour, density, pores and microcracks, hardness, yield and ultimate strengths, ductility of NCM. Nanostructured Electronics and Optoelectronic materials: NCM and data storage, nanorobotics, nanoelectronics – superlattice, quantum waves and dots, porous Si and Si clusters.

**Recommended literature:**
1. C.C. Koch, Nanostructured Materials – processing, Properties and Applications, WA Publishing, 2007.
Springer Hanbook of Nanotechnology, B. Bhusnan (Ed.), Springer 2007.
2. Nanomagnetism and Spintronics, T. Shinjo (Ed.) Elsevier 2009.
3. M.A. White, Physical Properties of Materials, CRC Press 2012.
4. N. Dahotre and A. Samant, Laser Machining of Advanced Materials, CRC Press 2011.
5. R. Oganov, Modern Methods of Crystal structure Prediction, Wiley-VCH, 2011.
6. G.B. Sergeev, Nanochemistry, Elsevier 2008.

7. M.A.Mayers et al: Nano and Microstructural Design of Advanced Materials, Elsevier 2003.

**Course language:**
english

**Course assessment**
Total number of assessed students: 14

| N | P |
|---|---|
| 0.0 | 100.0 |

**Provides:** Mgr. Vladimír Komanický, Ph.D., prof. RNDr. Pavol Sovák, CSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ NZ/04 | **Course name:** Non-reviewed collections of papers and monographs published abroad or in the country of residence |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 92 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

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|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ ODZP/14 | **Course name:** Defence of Doctoral Thesis |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 30 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 47 | |

| N | P |
|---|---|
| 0.0 | 100.0 |

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|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ PDS/18 | **Course name:** Writing Dissertation Work |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 15 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 22 | |

| N | P |
|---|---|
| 0.0 | 100.0 |

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|---|
| **Provides:** |
| **Date of last modification:** 17.04.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ POVK/04 | **Course name:** Work in Organizing Committee of Conference |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |

**Course assessment**

Total number of assessed students: 78

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ PPC/04 | **Course name:** Teaching activities |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 1 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 214 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ PPC/04 | **Course name:** Teaching activities |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 1 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 214 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ PVS/04 | **Course name:** Author's patents, discoveries, software |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 34 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPE/ PgVU/17 | **Course name:** Pedagogy for university teachers |
| **Course type, scope and the method:**<br>**Course type:** Lecture<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 28s<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |

**Course assessment**

Total number of assessed students: 12

| abs | n | neabs |
|---|---|---|
| 100.0 | 0.0 | 0.0 |

| |
|---|
| **Provides:** PaedDr. Renáta Orosová, PhD. |
| **Date of last modification:** 05.02.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** KPPaPZ/PsVU/17 | **Course name:** Psychology for University Lecturers |
| **Course type, scope and the method:**<br>**Course type:** Lecture<br>**Recommended course-load (hours):**<br>**Per week: Per study period:** 28s<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |

**Course assessment**

Total number of assessed students: 12

| abs | n | neabs |
|---|---|---|
| 100.0 | 0.0 | 0.0 |

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| **Provides:** Mgr. Marta Dobrowolska Kulanová, PhD., doc. PhDr. Beata Gajdošová, PhD. |
| **Date of last modification:** 20.02.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ RZ/04 | **Course name:** Reviewed Proceedings |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 169 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ SCI/04 | **Course name:** Citation registered in Science Citation Index |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 116 | |
| abs | n |
| 100.0 | 0.0 |
| **Provides:** | |
| **Date of last modification:** 01.03.2018 | |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. | |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ SDPR/04 | **Course name:** Co-worker of project supported by national grant schemes |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 388 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL1a/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 82

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL1b/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 2.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**

**Course assessment**
Total number of assessed students: 81

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, CSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL2a/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 3.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 77

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL2b/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 4.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**

**Course assessment**
Total number of assessed students: 80

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** prof. Ing. Martin Orendáč, CSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL3a/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 5.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 60

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

## COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL3b/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 6.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 60

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, CSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL4a/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 7.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 47

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SFKL4b/04 | **Course name:** Seminar in Solid State Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 1 / 1 **Per study period:** 14 / 14
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 8.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation at seminars.

**Learning outcomes:**
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions.

**Brief outline of the course:**
Contents is determined by the lectures and varies every year.

**Recommended literature:**
Selected scientific journals.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 48

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, CSc.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

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|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ SMPR/04 | **Course name:** Co-worker of project supported by international grant schemes |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 15 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 86 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SPM1/14 | **Course name:** Špeciálne praktikum I |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Active participation and preparing of measurement protocols.

**Learning outcomes:**
The objectives of the laboratory are: a. To gain some physical inside into some of the concepts presented in the lectures. b. To gain some practice in data collection, analysis and interpretation of resumance. c. To gain experience and report writing presentation and results.

**Brief outline of the course:**
Measurement of basic magnetic properties at ac and dc magnetisation, domain structure observation.
Measurement of magnetic properties using a SQUID magnetometer. Measurement of the dynamics of domain walls and measurement of magnetostriction.

**Recommended literature:**
Tumanski S, Handbook of magnetic measurements, CRC press, 2011.
Fiorillo F, Characterization and Measurement of Magnetic Materials, Elsevier, 2004.
Hajko V, Potocký L., Zentko A.: Magnetizačné procesy, Alfa, 1982, Bratislava.
Dufek M., Hrabák J., Trnaka Z.: Magnetická měření, SNTL, 1964, Praha

**Course language:**
english

**Course assessment**
Total number of assessed students: 23

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzer, PhD., RNDr. Ladislav Galdun, PhD.

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ SPM2/14 | **Course name:** Špeciálne praktikum II |
|---|---|

**Course type, scope and the method:**
**Course type:** Practice
**Recommended course-load (hours):**
**Per week:** 3 **Per study period:** 42
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Report from each experimental topic.

**Learning outcomes:**
To obtain experimental skils in modern method of structural analysis and nanotechnology using facilities located at physical laboratories in Košice. Analysis and interpretation of results in form of scientific report.

**Brief outline of the course:**
Specialized tasks from TEM and REM on selected samples. Structural observations using XRD on selected samples. Praparation techniques in nanolab and metallography lab. Measurements of nanoparticle size distribution by hydrodynamical method.

**Recommended literature:**
1. S. Amelincks, D.van Dyck, J. van Landyut, Electron Microscopy – Principles and Fundamentals, Wiley-VCH, 1997, ISBN:3-527-29479-1.
2. W.Reimers et al, Neutrons and Synchrotron Radiation in Engineering Materials Science, Wiley-VCH, 2008, ISBN 978-3-527-31533-8.
3. M.H. Loretto, Electron beam analysis of materials. Springer, 2002, ISBN 0-412-23400-9.
4. W.Hawks, J.C.H. Spence, Science of Microscopy, Springer, ISBN 10: 0-387-25296-7, 2007.
5. C.C. Koch, Nanostructured Materials – processing, Properties and Applications, WA Publishing, 2007, ISBN, 0-8155-1534-0.
6. Springer Hanbook of Nanotechnology, B. Bhusnan (Ed.), Springer 2007, ISBN 3-540-29855-7

**Course language:**
english

**Course assessment**
Total number of assessed students: 22

| abs | n |
|---|---|
| 100.0 | 0.0 |

**Provides:** Mgr. Vladimír Komanický, Ph.D., RNDr. Štefan Michalik, PhD., Ing. Vladimír Girman, PhD.

| |
|---|
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚCHV/ TA1/03 | **Course name:** Thermal Analysis |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2.

**Course level:** II., III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**
Goal of the course is to provide the students with a knowledge of experimental thermoanalytical techniques, the use of thermoanalytic methods for characterization of inorganic and organic compounds and reaction kinetics.

**Brief outline of the course:**
Introduction, experimental thermoanalytical techniques (thermogravimetric analysis, differential thermal analysis, thermomagnetic techniques, thermodilatometric analysis, high temperature reflectance spectroscopy). The use of thermoanalytic methods for characterization of inorganic and organic compounds, materials and pharmaceutical substances. Reaction kinetics.

**Recommended literature:**
Wendlandt, W. W.: Thermal Methods of Analysis, 2. vydanie, New York, 1985.
Schultze, D.: Differentialthermoanalyse, VEB Deutsch Verlag Wissenschaften, Berlin, 1969.
Heide, K.: Dynamische thermische Analysenmethoden, VEB Deutsch Verlag Wissenschaften, Leipzig, 1979.

**Course language:**

**Course assessment**
Total number of assessed students: 60

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 50.0 | 21.67 | 13.33 | 1.67 | 1.67 | 0.0 | 0.0 | 11.67 |

**Provides:** prof. RNDr. Vladimír Zeleňák, PhD.

**Date of last modification:** 25.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/BM/17 | **Course name:** Biomaterials |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

# COURSE INFORMATION LETTER

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/UMV/FAZY/17 | **Course name:** Theory of phase transformations in solids |
|---|---|

**Course type, scope and the method:**
**Course type:**
**Recommended course-load (hours):**
**Per week: Per study period:**
**Course method:** present

**Number of credits:** 20

**Recommended semester/trimester of the course:**

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 0

| N | P |
|---|---|
| 0.0 | 0.0 |

**Provides:**

**Date of last modification:** 01.03.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/FYZ/17 | **Course name:** Physics of solids |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

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|---|
| **Provides:** RNDr. František Kováč, CSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/KKM/17 | **Course name:** Structural ceramic materials: technology-microstructure-properties |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

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|---|
| **Provides:** prof. RNDr. Ján Dusza, DrSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/KRIP/17 | **Course name:** Creep of materials with limited plasticity |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** doc. RNDr. František Lofaj, DrSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/MAM/17 | **Course name:** Microstructural analysis of materials |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/MAT/17 | **Course name:** New materials and technologies |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

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|---|
| **Provides:** RNDr. Pavol Hvizdoš, CSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/MMV/17 | **Course name:** Microstructural nature of mechanical properties and limited states of materials |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/PM/17 | **Course name:** Powder functional composite materials |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 0 | |

| N | P |
|---|---|
| 0.0 | 0.0 |

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| **Provides:** Ing. Radovan Bureš, CSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ UMV/PMM/17 | **Course name:** Progressive methods of evaluating the microstructure of materials |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 2 | |

| N | P |
|---|---|
| 0.0 | 100.0 |

| |
|---|
| **Provides:** Ing. Karel Saksl, DrSc. |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚFV/ UNT1/99 | **Course name:** Introduction to Low Temperature Physics |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture
**Recommended course-load (hours):**
**Per week:** 2 **Per study period:** 28
**Course method:** present

**Number of credits:** 3

**Recommended semester/trimester of the course:** 1., 3.

**Course level:** III.

**Prerequisities:**

**Conditions for course completion:**
Successful passing final exam

**Learning outcomes:**
The course addresses fundamental concepts of physics of solid state. The students acquire information on the state of the art knowledge of selected structural, thermal, electric and magnetic properties of crystalline systems. Beside the standard materials an attention will be paid also to nonconventional systems. Basic experimental methods appropriate for studies of the mentioned properties will be overviewed.

**Brief outline of the course:**
Crystal structure. Wave diffraction and the reciprocal lattice. Crystal binding. Lattice vibrations, phonons. Fermi gases and liquids. Energy bands. Fermi surfaces. Superconductivity. Superconducting materials. Nonconventional superconductivity. Fundamental magnetic orders. Strong electron correlations.

**Recommended literature:**
1. Ch. Kittel: Introduction to Solid State Physics, 8th edition, John Wiley and sons, New York 2005.
2. H.Ibach, H.Luth: Solid-State Physics, Springer, Berlin 1996.
3. R. Kužel et al.: Úvod do fyziky kovú II, SNTL, Praha 1985.
4. P.Grosse: Svobodnyje elektrony v tverdych telach, Mir, Moskva, 1982
5. M Tinkham: Introduction to Superconductivity, 2-nd edition, Mc Graw- Hill, New York 1996.
6. S. Takács a L.Cesnak.: Supravodivosť, Alfa , Bratislava 1979
7. K. Fossheim, A. Sudbo, Superconductivity. Physics and Applications, John Wiley & Sons, Chichester, 2004.
8. James F. Annett, Superconductivity, Superfluids and Condensates, Oxford University Press, Oxford, UK.

**Course language:**
Slovak, English

**Course assessment**
Total number of assessed students: 23

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 78.26 | 8.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.04 |

**Provides:** Dr.h.c. prof. RNDr. Alexander Feher, DrSc.

**Date of last modification:** 26.09.2017

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ VBP/04 | **Course name:** Supervisor/consultant of bacelor thesis |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 6 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 35 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ VPBP/04 | **Course name:** Elaboration of reviewer report |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 18 | |
| abs | n |
| 100.0 | 0.0 |
| **Provides:** | |
| **Date of last modification:** 01.03.2018 | |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. | |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ VPSV/04 | **Course name:** Supervision of Student's Scientific Activity |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 6 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 14 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ VYS/04 | **Course name:** Presentation in Seminar |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 306 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

**University:** P. J. Šafárik University in Košice

**Faculty:** Faculty of Science

| **Course ID:** ÚCHV/ZCVU/04 | **Course name:** Chemical Engineering |
|---|---|

**Course type, scope and the method:**
**Course type:** Lecture / Practice
**Recommended course-load (hours):**
**Per week:** 2 / 1 **Per study period:** 28 / 14
**Course method:** present

**Number of credits:** 5

**Recommended semester/trimester of the course:** 2., 4.

**Course level:** I., II., III.

**Prerequisities:**

**Conditions for course completion:**

**Learning outcomes:**

**Brief outline of the course:**
General and Inorganic Engineering; Mineral raw materials; Raw materials processing, transport and holding; Chemical reactors; Chemical metallurgy – Fe, Al, Cu working; Inorganic acids manufacture (H2SO4, HNO3, HCl, HF, H3PO4); Industrial electrochemistry; Industrial fertilizers; Silicate industry – cement manufacture, ceramics; Petrochemistry

**Recommended literature:**

**Course language:**

**Course assessment**
Total number of assessed students: 12

| A | B | C | D | E | FX | N | P |
|---|---|---|---|---|---|---|---|
| 16.67 | 58.33 | 25.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Provides:** doc. RNDr. Zuzana Vargová, Ph.D.

**Date of last modification:** 26.02.2018

**Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc.

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ ZKC/04 | **Course name:** Journals Registered by Current Contets Database |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 20 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 366 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

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|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ ZNC/04 | **Course name:** Journals not registered in the Current Contents Connect database and published abroad |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 5 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 42 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

| |
|---|
| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |

**COURSE INFORMATION LETTER**

| | |
|---|---|
| **University:** P. J. Šafárik University in Košice | |
| **Faculty:** Faculty of Science | |
| **Course ID:** ÚFV/ ZSP/04 | **Course name:** Study Stay Abroad |
| **Course type, scope and the method:**<br>**Course type:**<br>**Recommended course-load (hours):**<br>**Per week: Per study period:**<br>**Course method:** present | |
| **Number of credits:** 2 | |
| **Recommended semester/trimester of the course:** | |
| **Course level:** III. | |
| **Prerequisities:** | |
| **Conditions for course completion:** | |
| **Learning outcomes:** | |
| **Brief outline of the course:** | |
| **Recommended literature:** | |
| **Course language:** | |
| **Course assessment**<br>Total number of assessed students: 233 | |

| abs | n |
|---|---|
| 100.0 | 0.0 |

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| **Provides:** |
| **Date of last modification:** 01.03.2018 |
| **Approved:** Guaranteeprof. RNDr. Pavol Sovák, CSc.Co-guaranteedoc. RNDr. Adriana Zeleňáková, PhD.Co-guaranteeprof. RNDr. Rastislav Varga, DrSc. |