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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 66

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 26

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **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:	
Notes:	

Course assessment
Total number of assessed students: 1

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 18

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

abs	n
0.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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: **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:	
Notes:	

Course assessment
Total number of assessed students: 47

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ POF1a/99	**Course name:** Computational Physics I

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., 4.

Course level: I., III.

Prerequisities:

Conditions for course completion:
Continuous evaluation is based on students' activity in the classroom and work on assignments. Examination and assignments submitted electronically with the attached computer code.

Learning outcomes:
To teach students to use computer as a tool of modeling of physical reality.

Brief outline of the course:
Introduction to dynamical systems. Numerical solution of ordinary differential equations (ODE) with initial value. Boundary value problems for ODE. Discrete schemes for partial differential equations (PDE). Numerical solution of PDE. Finite difference methods, consistency, convergence, stability. Eliptic and parabolic PDE. Introduction to Monte Carlo (MC) method and applicactions in statistical physics. MC simulations of lattice spin systems and stochastic processes.

Recommended literature:
1. C. Pozrikidis: Num. Comp. in Science and Engineering, Oxford Univ. Press, 1998.
2. A.L. Garcia: Numerical Methods for Physics, Prentice-Hall, 1994.
3. D. P. Landau, K. Binder: A Guide to Monte Carlo Simulations in Statistical Physics, Cambridge Univ. Press, 2000.
4. B. A. Berg: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis, http://www.worldscibooks.com/etextbook/5904/5904_intro.pdf
5. W. Janke: Lectures on Ising model, http://www.physik.uni-leipzig.de/~janke/Ising_Lectures_Lviv.html

Course language:

Notes:

Course assessment
Total number of assessed students: 74

A	B	C	D	E	FX	N	P
39.19	18.92	8.11	17.57	9.46	2.7	0.0	4.05

Provides: doc. RNDr. Milan Žukovič, PhD.

Date of last modification: 31.01.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 55

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment

Total number of assessed students: 221

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ ODZP/04	**Course name:** Defence of Doctoral Thesis
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 0	
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:	
Notes:	
Course assessment Total number of assessed students: 30	

N	P
0.0	100.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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:
Course type:
Recommended course-load (hours):
Per week: Per study period:
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:

Notes:

Course assessment
Total number of assessed students: 8

N	P
0.0	100.0

Provides:

Date of last modification: 17.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DODZ/11	**Course name:** Defence of Thesis
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 0	
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:	
Notes:	

Course assessment
Total number of assessed students: 7

N	P
0.0	100.0

Provides:
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DZP1a/04	**Course name:** Doctoral Thesis
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 34	

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DZP1b/04	**Course name:** Doctoral Thesis
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 66

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 15

N	P
0.0	100.0

Provides:

Date of last modification: 17.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DZS/04	**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: 0	
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:	
Notes:	

Course assessment
Total number of assessed students: 61

N	P
1.64	98.36

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 3

N	P
0.0	100.0

Provides: doc. RNDr. Rastislav Varga, DrSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 15

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Notes:

Course assessment
Total number of assessed students: 374

N	Ne	P	Pr	abs	neabs
0.0	0.0	75.4	0.0	24.6	0.0

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

Date of last modification: 06.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Notes:

Course assessment
Total number of assessed students: 375

N	Ne	P	Pr	abs	neabs
0.0	0.0	88.8	2.13	9.07	0.0

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

Date of last modification: 06.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 126

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚCHV/CMBU/03	**Course name:** Chémia materiálov a biomateriálov
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: III.	
Prerequisities: ÚCHV/ACHU/03	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 0	

N	P
0.0	0.0

Provides: prof. RNDr. Juraj Černák, CSc., doc. RNDr. Vladimír Zeleňák, PhD.
Date of last modification: 03.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: 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:

Notes:

Course assessment
Total number of assessed students: 5

A	B	C	D	E	FX	N	P
20.0	60.0	20.0	0.0	0.0	0.0	0.0	0.0

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

Date of last modification: 03.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ NEM/04	**Course name:** Implementation of new experimental methodology
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 48

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 185

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DZRC/11	**Course name:** International Reputable Journal
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:	
Notes:	

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DZRZ/11	**Course name:** International Reviewed Journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 0

abs	n
0.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: II., 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

Notes:

Course assessment
Total number of assessed students: 22

A	B	C	D	E	FX	N	P
81.82	9.09	0.0	0.0	0.0	0.0	0.0	9.09

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 62

A	B	C	D	E	FX	N	P
51.61	14.52	6.45	0.0	0.0	0.0	0.0	27.42

Provides: prof. RNDr. Peter Kollár, DrSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ CHMT/05	**Course name:** Materials Chemistry

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., 4.

Course level: II., III.

Prerequisities:

Conditions for course completion:
Seminar work.
Examination.

Learning outcomes:
To present the basic fundamentals of materials science and engineering.

Brief outline of the course:
Types and applications of materials. Synthesis, fabrication and processing of materials. Technical materials. Recent applications of technical materials. Principles of combined materials. Composites. Composites in history. Particulate composites. Filamentary composites. Nanomaterials. Semiconductors. Electric properties. Electronic and ionic conductivity. Biomaterials. Classification and function of biomaterials. Materials for third millenium. High-tech materials. Materials with intelligence and memory. Bionics and biomimetics. Materials and time. Ageing and fouling. Degradation processes in construction materials. Productional degradation. Operational degradation. Corrosion. Influence of hydrogen on metal properties. Selection of materials, requirements on materials. Principles of materials selection. Economic, environmental and societal issues in material chemistry. Investigation methods of the surface, structure and properties of materials.

Recommended literature:
W.D. Callister, Jr.: Fundamentals of Materials Science and Engineering, John Wiley & Sons, 2001.
L. Ptáček a kol.: Nauka o materiálu II., Akademické nakladatelství CERM, s.r.o., Brno 2002.

Course language:

Notes:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX	N	P
60.0	13.33	0.0	0.0	0.0	0.0	0.0	26.67

Provides: doc. RNDr. Renáta Oriňáková, PhD.
Date of last modification: 03.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ MPN/14	**Course name:** Methods of preparation and characterization of nanostructures

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: 3

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
powerpoint review of selected topic

Learning outcomes:
The goal of this course is to make an overview of methods used for fabrication of nanostructures and nanodevices.

Brief outline of the course:
This course teaches student about methods for fabrication of microelectromechanical devices, microanalytical devices and nanoobjects using top-down methods. I will make an overview of forces acting upon nanoobjects, thermodynamics on nanoscale. Overview of thin film preparation methods will be also given. I will talk about conventional and unconventional nanopatterning methods. Also application of nanostructures in fundamental and applied science will be described. Part of this course is also laboratory practice.

Recommended literature:
1. B. Bhushan Ed., Handbook of nanotechnology, Springer Academic Publishers, 2nd edition, 2007.
2. J. A. Rogers, H. H. Lee, Unconventional nanopatterning techniques and applications, Wiley, 1990.
3. G. Hornyak, J. Dutta, H. F. Tibbals, A. K. Rao, Introduction to nanocience CRC Press, 2008.
4. G. A. Ozin, A. C. Arsenault, L. Cademartiri, Nanochemistry A Chemical Approach to Nanomaterials, RSC Publishing, 2005.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 12

A	B	C	D	E	FX	N	P
41.67	0.0	0.0	0.0	0.0	0.0	0.0	58.33

Provides: Mgr. Vladimír Komanický, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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:

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

Notes:

Course assessment Total number of assessed students: 41	
N	P
0.0	100.0
Provides: prof. RNDr. Pavol Sovák, CSc.	
Date of last modification: 18.02.2014	
Approved: prof. RNDr. Pavol Sovák, CSc.	

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., 4.

Course level: II., III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 6

A	B	C	D	E	FX	N	P
66.67	0.0	0.0	0.0	0.0	0.0	0.0	33.33

Provides: doc. RNDr. Adriana Zeleňáková, PhD.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ NANO/09	**Course name:** Nanotechnology

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: I., III.

Prerequisities:

Conditions for course completion:
Examination.

Learning outcomes:
To provide the students with basic knowledge of nanotechnology, nanomaterials as well as preparation and investigation methods. Discusses current and future nanotechnology applications in engineering, physics, chemistry, biology, electronics and computing, energy and medicine.

Brief outline of the course:
Properties of nanomaterials. Methods of preparation of thin layers and nanostructured surfaces. Methods of submicron-sized structures production. Nanodevices and chips. Methods of nanomaterials structure investigation. Nanodevices and chips. Nanofluidic systems in biology, medicine , energy storage and catalysis.

Recommended literature:
1. Nanotechnológie, A. Oriňák, R. Oriňáková, A. Fedorková, PF UPJŠ, 2012.
2. Introduction to Nanotechnology, C. Poole Jr., F.J. Owens, Wiley (2003).
3. Nanoelectronics and Nanosystems, Karl Goser, Peter Glosekotter, Jan Dienstuhl., Springer, 2004.
4. Nano: The Essentials: T. Pradeep. McGraw – Hill education – 2007.
5. Nanofabrication Towards Biomedical Applications, Techniques, Tools, Applications and Impact. 2005 - By Challa, S.S.R. Kumar, Josef Hormes, Carola Leuschaer. Wiley – VCH.

Course language:

Notes:

Course assessment
Total number of assessed students: 154

A	B	C	D	E	FX	N	P
27.92	24.68	26.62	11.04	4.55	1.3	0.0	3.9

Provides: RNDr. Andrea Straková Fedorková, PhD., prof. RNDr. Andrej Oriňák, PhD., doc. RNDr. Renáta Oriňáková, PhD.

Date of last modification: 03.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 60	
abs	n
100.0	0.0
Provides:	
Date of last modification: 05.03.2014	
Approved: prof. RNDr. Pavol Sovák, CSc.	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DDNC/11	**Course name:** National Non-Reviewed Journal
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 1

abs	n
100.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DDRC/11	**Course name:** National Reviewed Journal
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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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:
Full-course elaboration of chosen topic and oral presentation with oral discussion.

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, hyperstructures, 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. Technology and materials of powder metallurgy. Thin layers and interphase boundary.

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

Course language:
Slovak language

Notes:
None.

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX	N	P
22.22	11.11	0.0	11.11	0.0	0.0	0.0	55.56

Provides: prof. RNDr. Pavol Sovák, CSc., Ing. Vladimír Girman, PhD.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DNZZ/11	**Course name:** Non-Reviewed International or National Proceedings
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 2

abs	n
100.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Course assessment
Total number of assessed students: 8

N	P
0.0	100.0

Provides: doc. RNDr. Adriana Zeleňáková, PhD., prof. RNDr. Pavol Sovák, CSc., prof. RNDr. Andrej Oriňák, PhD., doc. RNDr. Vladimír Zeleňák, PhD.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Course assessment
Total number of assessed students: 8

N	P
0.0	100.0

Provides: doc. RNDr. Adriana Zeleňáková, PhD., prof. RNDr. Pavol Sovák, CSc., prof. RNDr. Andrej Oriňák, PhD., doc. RNDr. Vladimír Zeleňák, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚCHV/ FCHIII/06	**Course name:** Physical Chemistry III

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

Number of credits: 10

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
Assesessment of student´s performance in seminars and homeworks.
Examination.

Learning outcomes:
To educate students in advanced theory and applications of physical chemistry and physicochemical methods in accord with present-day knowledge.

Brief outline of the course:
Theory of chemical bonds. Molecular structure and propertiies of molecules in solid and liquid state. Constitution, configuration and conformation. Mechanical, electrical, magnetical and optical properties of molecules. Molecular spectroscopy. Absoprption UVVIS, IR spectroscoy (repetition from basic courses). Mass spectrometry of a gaseous phase and transfer to a real processes. Femtosecond vibration spectroscopy, Raman spectroscopy and surface enhanced Raman spectroscopy. Surface plasmon resonance, nanostructured surfaces. Effect of nanostructure on intensity of surface plasmon resonance. Mie theory. Laser ionisation spectroscopy, fluorescent spectroscopy and analysis of one molecule. soft matter RTG SAXS, neutron analysis. Nanofluidic sstems and nanodevices.

Recommended literature:
T. Engel, P. Reid: Physical Chemistry, Pearson Educat. Inc., San Francisco 2006
P.W. Atkins : Physical Chemistry, Oxford University Press, Oxford 1998
W.R. Fawcett: Liquids, Solutions and Interfaces, Oxford University Press, Inc., New York 2004.
M. Hesse, H. Meier, B. Zeeh: Spectroscopic Methods in Organic Chemistry. Thieme, 1997.
Peter C. Schmidt: Methods in Physical Chemistry, Wiley-VCH Verlag GmbH and Co., 2012.
Recent scientific references.

Course language:

Notes:

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX	N	P
66.67	11.11	0.0	0.0	22.22	0.0	0.0	0.0

Provides: prof. RNDr. Andrej Oriňák, PhD., doc. RNDr. Renáta Oriňáková, PhD.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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., II., 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

Notes:

Course assessment
Total number of assessed students: 44

A	B	C	D	E	FX	N	P
65.91	4.55	2.27	2.27	0.0	0.0	0.0	25.0

Provides: doc. RNDr. Rastislav Varga, DrSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Notes:

Course assessment
Total number of assessed students: 49

A	B	C	D	E	FX	N	P
81.63	10.2	4.08	0.0	0.0	0.0	0.0	4.08

Provides: doc. RNDr. Vladimír Zeleňák, PhD.

Date of last modification: 03.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 190	

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DRZZ/11	**Course name:** Reviewed International or National Proceedings
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:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	

Course assessment
Total number of assessed students: 11

abs	n
100.0	0.0

Provides: prof. RNDr. Peter Kollár, DrSc., doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., Doc. RNDr. Jozef Hanč, PhD.
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 60

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Notes:

Course assessment
Total number of assessed students: 53

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 51

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:

Notes:

Course assessment
Total number of assessed students: 46

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 42

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 36

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 30

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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

Notes:

Course assessment
Total number of assessed students: 30

abs	n
100.0	0.0

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

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/ SPR1/00	**Course name:** Special Practical Exercises 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: 3

Recommended semester/trimester of the course: 3.

Course level: II., III.

Prerequisities:

Conditions for course completion:
Participation in exercises, reports from all exercies.

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.
Dufek M., Hrabák J., Trnaka Z.: Magnetická měření, SNTL, 1964, Praha
Brož J. a kol.: Základy fysikálnich měření, SPN, 1974, Praha.

Course language:
Slovak or English

Notes:

Course assessment
Total number of assessed students: 17

A	B	C	D	E	FX	N	P
82.35	0.0	0.0	0.0	0.0	0.0	0.0	17.65

Provides: doc. RNDr. Rastislav Varga, DrSc., doc. RNDr. Adriana Zeleňáková, PhD., doc. RNDr. Ján Füzer, PhD.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/SPR2/09	**Course name:** Special Practicum 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: 4

Recommended semester/trimester of the course: 4.

Course level: II., III.

Prerequisities:

Conditions for course completion:
Theoretical background of the practices, the activities and knowledges by the experiments. The analysis of the experimental data and quality of the experiment elaborates.
Summary of the work on practices (theoretical background of the practices, the activities and knowledges by the experiments. The analysis of the experimental data and quality of the experiment elaborates).

Learning outcomes:
To obtain fundamental theoretical and experimental skills in area of selected physical research of condensed matter, primarily at low temperatures.

Brief outline of the course:
Vacuum technology, Calibration of the thermometers, Heat capacity, Electron-spin resonance, Magnetic susceptibility and magnetisation, Electrical resistivity: measurement, analysis of the data, characterisation of the system.

Recommended literature:
J. H. Moore and N. D. Spencer: Encyclopedia o Chemical Physics and Physical Chemistry Vol. I., II. and III., IoP Publishing Ltd. 2001, ISBN 0750303131.

Course language:

Notes:

Course assessment
Total number of assessed students: 19

A	B	C	D	E	FX	N	P
57.89	5.26	15.79	0.0	0.0	0.0	0.0	21.05

Provides: RNDr. Erik Čižmár, PhD., prof. Ing. Martin Orendáč, CSc.

Date of last modification: 18.02.2014

Approved: prof. RNDr. Pavol Sovák, CSc.

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:	
Notes:	

Course assessment
Total number of assessed students: 52

abs	n
100.0	0.0

Provides: doc. RNDr. Vladimír Zeleňák, PhD.
Date of last modification: 06.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 131	

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 5

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 21	

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	
Course assessment Total number of assessed students: 143	

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ DDZS/11	**Course name:** 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: 0	
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:	
Notes:	

Course assessment
Total number of assessed students: 5

N	P
0.0	100.0

Provides:
Date of last modification: 18.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **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:	
Notes:	

Course assessment
Total number of assessed students: 28

abs	n
100.0	0.0

Provides:
Date of last modification: 05.03.2014
Approved: prof. RNDr. Pavol Sovák, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ PDS/14	**Course name:** Writing Dissertation Work
Course type, scope and the method: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of credits: 15	
Recommended semester/trimester of the course: 4.	
Course level: III.	
Prerequisities:	
Conditions for course completion:	
Learning outcomes:	
Brief outline of the course:	
Recommended literature:	
Course language:	
Notes:	
Course assessment Total number of assessed students: 14	

abs	n
100.0	0.0

Provides:
Date of last modification: 17.02.2014
Approved: prof. RNDr. Pavol Sovák, CSc.