CONTENT

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 ECTS 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: 130

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 38	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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

Notes:

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: 03.05.2015

Approved:

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 20

A	B	C	D	E	FX	N	P
20.0	60.0	15.0	5.0	0.0	0.0	0.0	0.0

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

Date of last modification: 23.02.2018

Approved:

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 28

A	B	C	D	E	FX	N	P
71.43	14.29	7.14	0.0	0.0	0.0	0.0	7.14

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 03.05.2015

Approved:

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 ECTS 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:
Approved:

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 ECTS 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: 67	

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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: 4

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 227

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 98	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 527

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides: doc. RNDr. František Lofaj, DrSc.
Date of last modification:
Approved:

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 ECTS 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: 94	

N	P
0.0	100.0

Provides:
Date of last modification: 03.05.2015
Approved:

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Science

Course ID: ÚFV/DZS/14	**Course name:** Dissertation examination

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

Number of ECTS credits: 20

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: 117

N	P
0.0	100.0

Provides:

Date of last modification: 03.05.2015

Approved:

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 ECTS 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: prof. RNDr. Rastislav Varga, DrSc.

Date of last modification: 03.05.2015

Approved:

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 ECTS 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: 20	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS credits: 2

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
Written assignments - professional CV, short academic biography (200-350 words).
distance mode of instruction using MS teams

Learning outcomes:

Brief outline of the course:

Recommended literature:

Course language:

Notes:

Course assessment
Total number of assessed students: 654

N	Ne	P	Pr	abs	neabs
0.0	0.0	51.38	0.0	48.62	0.0

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

Date of last modification: 11.02.2021

Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
Distance mode of instruction. Online consultations.
Test, oral exam in accordance with the exam requirements (https://www.upjs.sk/filozoficka-fakulta/cjp/doktorandi-upjs/)

Learning outcomes:
Development of students´language skills, improvement of students´linguistic competencies (selected aspects of English pronunciation, vocabulary and syntax), development of students´s pragmatic competence (selected aspects of functional grammar) with focus on English for academic and specific purposes. B2/C1 level of lanugage competence (according to CEFR.)

Brief outline of the course:
Specific aspecs of academic and professional English with focus on vocabulary development (noun and verb collocations, phrasal verbs, prepositional phrases, word-formation, formal/informal language, etc.), selected aspects of English grammar (prepositions, grammar tenses, passive voice, etc.), selected functional grammar (expressing opinion, cause/effect, arguments, examples, etc.). Academic communication. Cross-language interference.

Recommended literature:
Kolaříková, Z., Petruňová, H., Timková, R.: Angličtina v akademickom prostredí (cvičebnica). UPJŠ Košice, 2015
McCarthy, M., O´Dell, F.: Academic Vocabulary in Use. CUP, 2008
Štepánek, L., J. De Haff a kol.: Academic English-Akademická angličtina. Grada Publishing, a.s., 2011
Blašková, K.: Handbook of English for Postgraduate Students. Vyd. SPRINT Bratislava, 2007
Dušková, L. a kol.: Hovorová angličtina pre vedeckých a odborných pracovníkov. Veda. Bratislava, 1982
Armer, T.: Cambridge English for Scientists. CUP, 2011
Porter, D.: Check your vocabulary for Academic English. Macmillan Publishers Limited, 2008
Oxford Collocations Dictionary for students of English. OUP, 2002
lms.upjs.sk

Course language:

B2/C1 level according to CEFR

Notes:

Course assessment
Total number of assessed students: 649

N	Ne	P	Pr	abs	neabs
0.31	0.0	93.07	1.23	5.39	0.0

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

Date of last modification: 10.02.2021

Approved:

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 ECTS 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: 303

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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: 426

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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

Notes:

Course assessment
Total number of assessed students: 24

A	B	C	D	E	FX	N	P
75.0	8.33	0.0	0.0	0.0	0.0	0.0	16.67

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

Date of last modification: 03.05.2015

Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 496

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 54

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 23

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 8

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 39

N	P
0.0	100.0

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

Date of last modification: 03.05.2015

Approved:

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 ECTS credits: 6

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
Elaboration of written texts.
Distance oral exam.

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: 114

A	B	C	D	E	FX	N	P
40.35	15.79	9.65	2.63	1.75	1.75	0.88	27.19

Provides: prof. RNDr. Peter Kollár, DrSc.

Date of last modification: 26.03.2020

Approved:

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 ECTS 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:

Notes:

Course assessment Total number of assessed students: 0	
abs	n
0.0	0.0
Provides: RNDr. Kornel Richter, PhD.	
Date of last modification: 20.02.2017	
Approved:	

COURSE INFORMATION LETTER

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 ECTS credits: 7

Recommended semester/trimester of the course: 2.

Course level: I., II., III.

Prerequisities:

Conditions for course completion:
Elaboration of practical projects on electron microscopy and XRD diffractometry topics (75%) and final test with oral examination (25%)

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. P. Sovák et al, Vybrané moderné metódy štruktúrnej analýzy kovov, VŠ učebné texty, UPJŠ, 2007
2. P.W. Hawkes, J.C.H Spence, Science of Microscopy, Springer, ISBN10: 0-387-25296-7, 2007
3. C. B. Carter, J. B. Williams, Transmission electron microscopy, ISBN 978-0-387-76500-6, 2012
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:
1. English

Notes:

Course assessment
Total number of assessed students: 86

A	B	C	D	E	FX	N	P
39.53	22.09	8.14	1.16	0.0	0.0	0.0	29.07

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

Date of last modification: 28.06.2021

Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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	

N	P
0.0	100.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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

Notes:

Course assessment
Total number of assessed students: 65

N	P
0.0	100.0

Provides: prof. RNDr. Pavol Sovák, CSc., doc. Ing. Karel Saksl, DrSc., RNDr. Jozef Bednarčík, PhD.

Date of last modification: 03.05.2015

Approved:

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 ECTS 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:
Classification of nanomaterials (thin films and surfaces, carbon nanotubes, inorganic nanotubes, nanodots, biopolymers, nanoparticles, nanocomposites, fullerenes, dendrimers, quantum dots). Nanomanufacturing and fabrication techniques (chemical synthesis: reverse micelle method, sol-gel method, precipitation, self- assembly, positional assembly, chemical vapour deposition, MBE molecular beam epitaxy, ultra-precision, , lithography, SPD (spark plasma deposition). Possible adverse health, environmental and safety impacts. Magnetic nanomaterials, physical properties and structural properties of nanomaterials (superparamagnetism, quantum size effect, quantum of magnetization, effect of monodomains particles). Magnetic nanomaterials as advanced materials for information technology, biotechnology and industry.

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:
Week 1:
Definition, history, present and future of nanotechnologies. Basic concepts and metrology in nanotechnologies.
Week 2:
Nanomaterials in 1D dimension: thin films, thin films and surfaces; nanomaterials in 2D dimensions: carbon nanotubes, inorganic nanotubes, nanowires, biopolymers, nanomaterials in 3D dimensions: nanoparticles, fullerenes, dendrimers, and quantum dots.

Week 3:
Preparation of nanomaterials. Preparation of nanomaterials by bottom-up techniques: chemical syntheses (micelle method, reverse micelle method, sol-gel method, precipitation), self-assembly, controlled assembly, spin coating, dip coating.
Week 4:
Bottom-up techniques PVD, CVD method (physical/chemical vapor deposition), MBE method (molecular beam epitaxy).
Week 5:
Preparation of nanomaterials by top-down techniques: cutting, grating, etching, lithography, SPD (spark plasma deposition).
Week 6:
Nnaocarbon: fullerens, nanocons, carnon nanotubes (SWCNT, MWCNT), properties and applications
Week 7:
Nanogold. Suface plasmon resonance. Preparation and classification nanogold materials.
Week 8:
Origin of nanomagnetism. Density of electron states.
Week 9:
The phenomenon of superparamagnetism in magnetic nanomaterials. Behavior of spin glass, comparison of theoretical models and experiment. Nanomagnetic models. Modeling of physical and structural properties of magnetic nanomaterials
Week 10:
Magnetic nanomaterials in biotechnology and nano-medicine: drug carriers, DNA chips, materials for MRI (magnetic resonance imaging), nanomaterials in the treatment of cancer.
Week 11:
Magnetic nanomaterials for industrial catalysis and gas separation: nanoparticles in ordered porous matrices.
Week 12:
Magnetic nanomaterials in information-telecommunication technologies and optoelectronics: computer chips, high-density recording media, hard disks, memories, sensors, quantum cryptographs, photon crystals for quantum computers.

Course assessment
Total number of assessed students: 42

A	B	C	D	E	FX	N	P
40.48	0.0	0.0	0.0	0.0	0.0	0.0	59.52

Provides: doc. RNDr. Adriana Zeleňáková, PhD.

Date of last modification: 25.03.2021

Approved:

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 ECTS 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: 143	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	
N	P
0.0	0.0
Provides: RNDr. Pavol Hvizdoš, CSc.	
Date of last modification:	
Approved:	

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 ECTS credits: 3

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

Course level: II., III.

Prerequisities:

Conditions for course completion:
The final exam consists of written and oral examination.

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:
W. D. Callister Jr., D. G. Rethwisch, Materials Science and Engineering: An Introduction, 10th Edition, ISBN 978-1-119-40549-8, 2018
L. Ptáček a kol.: Náuka o materiálu I a II, ISBN 8072042483, 2002
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: 34

A	B	C	D	E	FX	N	P
35.29	17.65	0.0	2.94	2.94	0.0	0.0	41.18

Provides: Ing. Vladimír Girman, PhD.
Date of last modification: 28.06.2021
Approved:

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 109

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

COURSE INFORMATION LETTER

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: **Course type:** Lecture **Recommended course-load (hours):** **Per week: Per study period:** 28s **Course method:** present	
Number of ECTS 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: 33

abs	n	neabs
100.0	0.0	0.0

Provides: doc. PaedDr. Renáta Orosová, PhD.
Date of last modification: 08.06.2021
Approved:

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 ECTS 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: 33

N	P
0.0	100.0

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

Date of last modification: 23.02.2016

Approved:

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 ECTS 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: 34

N	P
0.0	100.0

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

Date of last modification: 29.03.2020

Approved:

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 ECTS credits: 3

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

Course level: 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: 65

A	B	C	D	E	FX	N	P
61.54	4.62	1.54	1.54	0.0	0.0	0.0	30.77

Provides: RNDr. Ladislav Galdun, PhD.

Date of last modification: 03.05.2015

Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides: RNDr. František Kováč, CSc.	
Date of last modification:	
Approved:	

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 ECTS 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: 88

A	B	C	D	E	FX	N	P
77.27	10.23	2.27	0.0	0.0	0.0	0.0	10.23

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 03.05.2015

Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides: Ing. Radovan Bureš, CSc.	
Date of last modification:	
Approved:	

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 ECTS 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: 369

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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

Notes:

Course assessment
Total number of assessed students: 21

N	P
0.0	100.0

Provides: Mgr. Vladimír Komanický, Ph.D.

Date of last modification: 03.05.2015

Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 3	

N	P
0.0	100.0

Provides: doc. Ing. Karel Saksl, DrSc.
Date of last modification:
Approved:

COURSE INFORMATION LETTER

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:
Course type: Lecture
Recommended course-load (hours):
Per week: Per study period: 28s
Course method: present

Number of ECTS credits: 5

Recommended semester/trimester of the course:

Course level: III.

Prerequisities:

Conditions for course completion:

Learning outcomes:

Brief outline of the course:
University teacher and his work in the teaching process with a focus on:
teacher in relation to himself (cognitive, personality, social competencies and competencies in the use of methods), in relation to students and as part of the teacher-student relationship based on selected areas of cognitive psychology, psychology of emotions and motivation, developmental psychology, social psychology , educational psychology and health psychology with application to the university environment.

Recommended literature:
Alexitch, L. R. (2005). Applying social psychology to education. Social Psychology.–Ed.: Schneider F., Gruman J., Coutts L.–Sage Publications, Inc, 205-228.
Fry, H., Ketteridge, S., & Marshall, S. (2008). A handbook for teaching and learning in higher education: Enhancing academic practice. Routledge.
Mareš, J.: Pedagogická psychologie. Portál, 2013.
Kniha psychologie. Universum, 2014
Čáp, J., Mareš, J.: Psychologie pro učitele. Praha: Portál 2007.
Vágnerová, M.: Školní poradenská psychológie pro pedagogy. Praha: Karolínum 2005.

Course language:

Notes:

Course assessment
Total number of assessed students: 37

abs	n	neabs
100.0	0.0	0.0

Provides: PhDr. Anna Janovská, PhD.

Date of last modification: 28.06.2021

Approved:

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 235

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 1.

Course level: III.

Prerequisities:

Conditions for course completion:
Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 99

abs	n
100.0	0.0

Provides: doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.
Date of last modification: 02.07.2021
Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 2.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:

Notes:

Course assessment
Total number of assessed students: 99

abs	n
100.0	0.0

Provides: Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.
Date of last modification: 02.07.2021
Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 3.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 86

abs	n
100.0	0.0

Provides: doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.

Date of last modification: 02.07.2021

Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 4.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

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: 90

abs	n
100.0	0.0

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

Date of last modification: 02.07.2021

Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 5.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:
Slovak, English

Notes:

Course assessment
Total number of assessed students: 75

abs	n
100.0	0.0

Provides: doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.

Date of last modification: 02.07.2021

Approved:

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 ECTS credits: 3

Recommended semester/trimester of the course: 6.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 74	
abs	n
100.0	0.0
Provides: Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.	
Date of last modification: 02.07.2021	
Approved:	

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 ECTS credits: 3	
Recommended semester/trimester of the course: 7.	
Course level: III.	
Prerequisities:	
Conditions for course completion: 1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis. 2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.	
Learning outcomes: Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.	
Brief outline of the course: The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.	
Recommended literature: Selected scientific journals.	
Course language: Slovak, English	
Notes:	

Course assessment Total number of assessed students: 65	
abs	n
100.0	0.0
Provides: doc. RNDr. Alžbeta Orendáčová, DrSc., Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.	
Date of last modification: 02.07.2021	
Approved:	

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 ECTS credits: 3

Recommended semester/trimester of the course: 8.

Course level: III.

Prerequisities:

Conditions for course completion:
1. Participation on the seminars (valid also for on-line form of presentations). Students are obliged to participate on the seminars. Reasons should be given for any absence, students may absent up to twice per semester without further consequences. For more frequent absence student will prepare presentation focused on a topic which will be consulted with the supervisor of the seminar. Each student has to present at least one his/her contribution, usually before defending his/her diploma thesis.
2. Activity on the seminar, participation in discussion. Level of presenting student´s own presentation.

Learning outcomes:
Students will obtain informations about scientific results of various research groups from Košice and from their cooperating foreign institutions and will be stimulated for scientific discussion. They will also improve their presentation skills.

Brief outline of the course:
The program of seminars from condensed matter physics is prepared every year and is devoted to the recent results achieved in the field of condensed matter physics and material research at the laboratories in Košice and abroad. Scientific workers from laboratories from Košice as well as domestic and foreign guests give the talks. The program also involves presentation of PhD and diploma theses.

Recommended literature:
Selected scientific journals.

Course language:
Slovak, English

Notes:

Course assessment Total number of assessed students: 66	
abs	n
100.0	0.0
Provides: Dr.h.c. prof. RNDr. Alexander Feher, DrSc., prof. Ing. Martin Orendáč, DrSc.	
Date of last modification: 02.07.2021	
Approved:	

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 ECTS 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: 154

abs	n
100.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD.
Date of last modification: 03.05.2015
Approved:

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 0	

N	P
0.0	0.0

Provides: prof. RNDr. Ján Dusza, DrSc.	
Date of last modification:	
Approved:	

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Science	
Course ID: ÚFV/ XRAY/20	**Course name:** Structure characterization by X-ray based techniques

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 ECTS credits: 3

Recommended semester/trimester of the course:

Course level: II., III.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To understand basic concepts of the X-ray crystallography and X-ray powder diffraction. Be able to perform phase analysis, refine the value of the lattice constant and estimate the average grain size from raw diffraction data. To understand basic concepts of the synchrotron radiation and its properties. Get familiarized with selected scattering, spectroscopy and imaging techniques utilizing synchrotron radiation.

Brief outline of the course:
X-rays are a unique tool to characterize the atomic and electronic structure of many materials, including periodic/ordered and non-periodic/disordered systems. X-ray diffraction and scattering methods provide structural information of mainly periodic systems down to atomic resolution. The course is divided in two sections. The first part covers basic concepts of the X-ray crystallography and X-ray powder diffraction, which represents one of the most essential tools in the structural characterization of materials. The first part is complemented with a hands-on laboratory section which aims to prepare reader to be able to independently deploy the technique for use in own research. The second part of the course covers basics concepts of the synchrotron radiation. Perspective reader will learn about unique properties of synchrotron radiation and its use in various scattering, spectroscopy and imaging techniques. The layout of typical synchrotron beamline with all essential components (monochromator, mirrors, focusing lenses, slit systems, sample stage and detectors) will be presented. Experimental techniques such as Small Angle X-ray Scattering (SAXS), Pair Distribution Function (PDF), X-ray Absorption Spectroscopy and X-ray Computed Tomography will be introduced in more details. At the end there will be a lesson covering recent development in the emerging field of X-ray Free Electron Lasers (XFELs)

Recommended literature:
[1] V. K. Pecharsky and P. Y. Zavalij, „Fundamentals of Powder Diffraction and Structural Characterization of Materials“, Springer, New York, 2005.
[2] D. Attwood and A. Sakdinawat, „X-Rays and Extreme Ultraviolet Radiation: Principles and Applications“, 2nd Edition, Cambridge University Press, 2016.
[3] M. Watanabe, S. Sato, I. Munro and G.S. Lodha, „A Guide to Synchrotron Radiation Science“, Narosa Publishing House. New Delhi, 2016

[4] U. Bergmann, V. K. Yachandra and J. Yano, „ X-Ray Free Electron Lasers: Applications in Materials, Chemistry and Biology“, The Royal Society of Chemistry, London, 2017

Course language:

Notes:

Course assessment
Total number of assessed students: 6

abs	n
100.0	0.0

Provides: RNDr. Jozef Bednarčík, PhD.

Date of last modification: 20.02.2020

Approved:

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 ECTS 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: 259	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 16	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 40	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 252	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

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 ECTS 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: 252

abs	n
100.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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: 0	

N	P
0.0	0.0

Provides:	
Date of last modification:	
Approved:	

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 ECTS 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:

Notes:

Course assessment
Total number of assessed students: 67

A	B	C	D	E	FX	N	P
53.73	19.4	11.94	1.49	1.49	0.0	0.0	11.94

Provides: prof. RNDr. Vladimír Zeleňák, DrSc.

Date of last modification: 03.05.2015

Approved:

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 ECTS 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: 95	

abs	n
100.0	0.0

Provides:
Date of last modification:
Approved:

COURSE INFORMATION LETTER

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: **Course type:** **Recommended course-load (hours):** **Per week: Per study period:** **Course method:** present	
Number of ECTS 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: 22	

N	P
0.0	100.0

Provides:
Date of last modification:
Approved:

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 ECTS 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

Notes:

Course assessment
Total number of assessed students: 33

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: 23.09.2015

Approved:

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 ECTS credits: 5

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

Course level: III.

Prerequisities:

Conditions for course completion:
Elaboration report from each experimental topic.

Learning outcomes:
Obtain experimental skills 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 SEM 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

Notes:

Course assessment
Total number of assessed students: 28

abs	n
100.0	0.0

Provides: Mgr. Vladimír Komanický, Ph.D., RNDr. Štefan Michalik, PhD., Ing. Vladimír Girman, PhD.
Date of last modification: 28.06.2021
Approved: