COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ASFU/15	**Course name:** Astrophysics

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

Number of credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
Test within the curriculum presented during the course; seminar essay.
Oral exam with preparation; 3 questions within the curriculum presented during the course.

Learning outcomes:
Become acquainted with basic knowledge about the structure and evolution of the universe.

Brief outline of the course:
The stars, their basic properties, structure and evolution. Structure and distribution of matter in the universe. Cosmological theories, formation, evolution and future of the universe.

Recommended literature:
1. Carroll, B. W., Ostlie, D. A., An Introduction to Modern Astrophysics, Addison-Wesley Publishing Company, Reading, Massachusetts, 1996;
2. Contopoulos, D. Kotsakis, Cosmology, the structure and evolution of the Universe, Springer, 1984;
3. Narlikar, J.V.,An Introduction to Cosmology, Cambridge University Press, Cambridge, 2002;
4. Pasachoff, J.M., Filippenko, A., The Cosmos: Astronomy in the New Millennium, Cambridge University Press, 2013;

Course language:
Slovak, English

Course assessment
Total number of assessed students: 4

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Rudolf Gális, PhD.

Date of last modification: 21.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DEJ1/99	**Course name:** History of Physics

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: I., II.

Prerequisities:

Conditions for course completion:
written test and thesis
exam

Learning outcomes:
Basic facts in the history of physics.

Brief outline of the course:
Evolution of knowledge before Galileo. Evolution of physics within the mechanical picture of the world. Evolution and limits of classical physics, phase of breakthrough in physics. Origin and evolution of the theory of relativity. Quantum physics and prospects of further evolution of physics and their application. Contemporary state of physical research and its application in technology, natural sciences and philosophy. Position of physics in our society.

Recommended literature:
1. R.Zajac, J.Chrapan: Dejiny fyziky, skriptá, MFF UK, Bratislava, 1982.
2. V.Malíšek: Co víte o dějinách fyziky, Horizont, Praha, 1986.
3. I.Kraus, Fyzika v kulturních dějinách Evropy, Starověk a středověk, Nakladatelství ČVUT, Praha, 2006.
4. A.I.Abramov: Istoria jadernoj fiziky, KomKniga, Moskva, 2006.
5. L.I.Ponomarev: Pod znakom kvanta, Fizmatlit, Moskva, 2006.
6. I.Kraus, Fyzika v kulturních dějinách Evropy, Od Leonarda ke Goethovi, Nakladatelství ČVUT, Praha, 2007.
7. I.Kraus, Fyzika od Thaléta k Newtonovi, Academia, Praha, 2007.
8. I.Štoll, Dějiny fyziky, Prometheus, Praha, 2009.
9. www-pages.
10.Brandt S., The harvest of a century, Discoveries of modern physics in 100 episodes, Oxford, 2009.

Course language:

Course assessment
Total number of assessed students: 22

A	B	C	D	E	FX
81.82	9.09	9.09	0.0	0.0	0.0
Provides: prof. RNDr. Stanislav Vokál, DrSc.					
Date of last modification: 20.02.2017					
Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DEX/15	**Course name:** Selected Demonstration Experiments

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

Number of credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Seminar work – a project dealing with hands-on experiments and their role in Physics teachig.
Oral examination

Learning outcomes:
The goal of the course is to develop pedagogic skills and creativity of further Physics teachers through non-traditional physical experiments.

Brief outline of the course:
The aim of the lecture is to show a lot of non-traditional physical experiments which can help students understand physical phenomena and find their connection with everyday life. The experiments are mainly hands-on ones which can be performed with simple tools and don't require any special equipment. The experiments are carried out by students themselves. Through these experiments students are able to gain practical skills, develop experimental habits and verify their theoretical knowledge.

Recommended literature:
1. Onderová Ľ.:Netradičné experimenty vo vyučovaní fyziky, MC Prešov,2002
2. Lorbeer,G.L.,Nelsonová, L.W.: Fyzikální pokusy pro děti, Portál, Praha, 1998
3. Kostič, Ž.: Medzi hrou a fyzikou, Alfa, Bratislava, 1971
4. Kireš, M., Onderová, Ľ.: Fyzika každodenného života v experimentoch a úlohách, JSMF Bratislava 2001, ISBN 80-7097-446-X
5. http://physedu.science.upjs.sk/sis/fyzika/experimenty/index.htm

Course language:
Slovak

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: PaedDr. Iveta Štefančínová, Ph.D.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DF1a/15

Course name: Didactics of Physics I

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

Number of credits: 4

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
teaching plan for two lessons 10p
micro teaching activities 20p
educational project 20p
answering questions during the course 10p
end-of course oral examination 40p

Learning outcomes:
Knowledge and skills in the field of Physics education, overview about the problems of Physics education, basic skills necessary to prepare and quide educational activities, school experiments, problem solving and to use modern media for physics education.

Brief outline of the course:
Within the Didactics of Physics subject the core problems of physics education are introduced and case studies of their solving are interpreted. Strategies on design and implementation of educational activities, their evaluation and the use of modern media are introduced and corresponding skills are trained.

Recommended literature:
1.J. Janovič a kol.: Didaktika fyziky, MFF UK Bratislava, 1990
2.J. Janovič a kol.: Vybrané kapitoly didaktiky fyziky, MFF UK Bratislava, 1999
3.E. Kašpar a kol.: Didaktika fyziky, SPN Praha, 1978
4.E. Mechlová: Didaktika fyziky 1, 2, PdF Ostrava, 1989
5.J. Fenclová: Úvod do teórie a metodológie didaktiky fyziky, SPN Praha, 1982
Primary school textbooks for Physics
actuall didactic publications

Course language:
Slovak, English

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
55.56	44.44	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD., PaedDr. Iveta Štefančínová, Ph.D.
Date of last modification: 23.02.2017
Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DF1b/15	**Course name:** Didactics of Physics II

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

Number of credits: 4

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities: ÚFV/DF1a/15

Conditions for course completion:
teaching plan for two lessons 10p
micro teaching activities 20p
educational project 20p
answering questions during the course 10p
end-of course oral examination 40p

Learning outcomes:
knowledge and skills in the field of Physics education, overview about the problems of Physics education, basic skills necessary to prepare and quide educational activities, school experiments, problem solving and to use modern media for physics education

Brief outline of the course:
1. Didactic methods, forms and tools in physics education
2. Graphs in education
3. Control, evaluation and assessment of students results,
4. Tests
5. Everyday physics and its application in education
6. Computer based measurements:
7. Using of Internet and multimedia in education
8. IBSE
9. Informal activities to support physics education
10. Life long learning, science teacher training
11. 12. Semestral project presentation

Recommended literature:
1.J. Janovič a kol.: Didaktika fyziky, MFF UK Bratislava, 1990
2.J. Janovič a kol.: Vybrané kapitoly didaktiky fyziky, MFF UK Bratislava, 1999
3.E. Kašpar a kol.: Didaktika fyziky, SPN Praha, 1978
4.E. Mechlová: Didaktika fyziky 1, 2, PdF Ostrava, 1989
5.J. Fenclová: Úvod do teórie a metodológie didaktiky fyziky, SPN Praha, 1982
6.Vachek, J. a kol.: Fyzika pre 1. ročník gymnázia. SPN, Bratislava, 1984.
7.Svoboda, E. a kol. Fyzika pre 2. ročník gymnázia. SPN, Bratislava, 1985.
8.Lepil, O. a kol.: Fyzika pre 3. ročník gymnázia. SPN, Bratislava, 1986.

9.Pišút, J. a kol.: Fyzika pre 4. ročník gymnázia. SPN, Bratislava, 1987.
10.Scholtz, E., Kireš, M.: Fyzika - Kinematika pre osemročné gymnáziá, SPN, Bratislava, 2001, 104 strán, ISBN 80-08-02848-3
11.Blaško, M., Gajdušek, J., Kireš, M., Onderová, Ľ.: Molekulová fyzika a termodynamika pre osemročné gymnáziá, SPN, Bratislava, 2004, 120 strán, ISBN 80-10-00008-6
12.Scholtz, E., Kireš, M.: Fyzika - Dynamika pre osemročné gymnáziá, SPN, Bratislava, 2007, 231 strán, ISBN 80-10-00013-2
School textbooks for Physics education at upper secondary level

Course language:
Slovak, English

Course assessment
Total number of assessed students: 5

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD., PaedDr. Iveta Štefančínová, Ph.D.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/DPOU/14	**Course name:** Diploma Thesis and its Defence

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

Number of credits: 15

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
Preparation and submission of diploma thesis in printed and electronic form.
Presentation of diploma thesis results and its defence in front of examination board.

Learning outcomes:
Knowledge and skills connected with selected problem analysis and presentation of diploma thesis results in front of experts.

Brief outline of the course:
Preparation and submission of diploma thesis to central registration system.
Printed version for reviewing.
Presentation of diploma thesis results and answers to the questions of reviewrs.
Discussion on the content of diploma thesis and answers to the questions of examination board members.

Recommended literature:

Course language:

Course assessment
Total number of assessed students: 15

A	B	C	D	E	FX
73.33	13.33	13.33	0.0	0.0	0.0

Provides:

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DPP1/14	**Course name:** Diploma Project I

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

Number of credits: 1

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
regular consultations with diploma thesis supervisor about the progress of diploma project development, design of investigation plan

Learning outcomes:
Student has studied the theoretical background, formulates research questions, has designed investigation plan, has presented first results, eventually.

Brief outline of the course:
Development of diploma project

Recommended literature:
Recommended literature that is included in the diploma thesis assignments
Regulations for diploma thesis preparation
template for diploma thesis

Course language:
Slovak

Course assessment
Total number of assessed students: 10

abs	n
100.0	0.0

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DPP2/14	**Course name:** Diploma Project II

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
regular consultaions with diploma thesis supervisor about the progress of diploma project development and about the investigation
regular consultations
study of available resources connected with the diploma thesis assignments
first results

Learning outcomes:
Student understands the methods of investigation and he gains first results.

Brief outline of the course:
Work on the diploma project with regard to the assignemnts of the diploma thesis

Recommended literature:
Recommended literature that is included in the diploma thesis assignments
Regulations for diploma thesis preparation
template for diploma thesis

Course language:
Slovak

Course assessment
Total number of assessed students: 10

abs	n
100.0	0.0

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ DPP3/14	**Course name:** Diploma Project III

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
regular consultations with diploma thesis supervisor about the progress of diploma project development and about the project results

Learning outcomes:
Student has enough knowledge to prepare a theoretical part of the diploma thesis and for practical part based on the problem analysis and drawing conclusions.

Brief outline of the course:
Work on the project with regard to the diploma thesis assignments

Recommended literature:
Recommended literature that is included in the diploma thesis assignments
Regulations for diploma thesis preparation
template for diploma thesis

Course language:
Slovak

Course assessment
Total number of assessed students: 15

abs	n
100.0	0.0

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ FEP1/15	**Course name:** School Computer-Based Physical Laboratory

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

Number of credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
The final assessment is based on the sum of partial results
Test 30 points
active participation 10 points
project (development of mathematical model, videomeasurement and physical experiment) 60 points

Learning outcomes:
After the course student gains an overview about the possible use of digital technologies to support active learning in physics. He gains skills to use and develop activities on measuring data with the help of datalogging, measuring on videorecordings and picture and modeling physical processes. Student is able to implement such activities in physics teaching to support active learning and conceptual understanding.

Brief outline of the course:
The aim of the course is to present the use of digital technologies to enhance active learning in science with the help of datalogging, videomeasurement, measurement from the picture and modeling tools. Mathematical modeling is based on dynamical modeling of physical phenomena. Within the course students carry out computer-based experiments, videomeasurements and measurement on the picture and create corresponding models. The activities involve selected topics of secondary school physics. The emphasize is put on the methods of implementation of the activities with regard to active students´ learning.

Recommended literature:
[1]Koubek, V., Pecen, I.: Fyzikálne experimenty a modely v školskom mikropočítačom podporovanom laboratóriu, Univerzita Komenského, Bratislava, 1999
[2]Príručka COACH
[3]http://physedu.science.upjs.sk/sis/fyzika/experimenty/index.htm

Course language:
Slovak

Course assessment
Total number of assessed students: 7

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0
Provides: doc. RNDr. Zuzana Ješková, PhD.					
Date of last modification: 23.02.2017					
Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ FKS/15	**Course name:** Solid State Physics

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

Number of credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
oral examination

Learning outcomes:
A general introductory course in solid state physics and material science.

Brief outline of the course:
Crystal structures and methods of structure analysis. Defects in crystalline solids. Chemical bonding in solids. Thermal properties of crystal lattice. "Free" electrons in metals. The electronic band structure of solids. Transport phenomena in metals and semiconductors. Superconductivity and superfluidity. Magnetic properties of solids. New problems of condensed matter physics.

Recommended literature:
H. Ibach, H. Lüth: Solid-State Physics. Springer - Verlag, Berlin, 1993.
Ch. Kittel: Introduction to Solid State Physics. John Wiley & Sons, Inc. 1976.

Course language:

Course assessment
Total number of assessed students: 6

A	B	C	D	E	FX
50.0	33.33	16.67	0.0	0.0	0.0

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

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ FPK1/15	**Course name:** Phase Transitions and Critical Phenomena

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

Number of credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
Grade

Learning outcomes:
To acquaint students with based problems of the phase transitions and critical phenomena.

Brief outline of the course:
Thermodynamics of phase transitions. Classification of phase transitions. Critical phenomena, universality. Microscopic models of the magnetic phase transitions. Ising model in one and two dimensions. Mean field theory of the Ising model. Landau theory of phase transitions.

Recommended literature:
1. Stanley H.G.: Introduction to Phase Transitions and Critical Phenomena, Clarendon Press Oxford, Oxford, 1971.
2. Reichl L.E.: A Modern Course in Statistical Physics, University of Texas Press, Austin, 1980.
3. Plischke M., Bergersen B.: Equilibrium Statistical Physics, World Scientific, Singapore, 1994.
4. Kadanoff L.P.: Statistical Physics, Statistics, Dynamics and Renormalization, World Scientific, Singapore, 2000.

Course language:
Slovak

Course assessment
Total number of assessed students: 44

A	B	C	D	E	FX
72.73	9.09	4.55	6.82	6.82	0.0

Provides: prof. RNDr. Andrej Bobák, DrSc.

Date of last modification: 21.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ FYU1/15	**Course name:** Physical Problems

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

Number of credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
On- line set of problems for self solving is avialable for students. One task is define for each seminar for testing of student preparation. Production and presentation of three own problems is necessary.
problem solving 40 p
obtained problem 10 p
own problems 10 p
oral examination 40 p
Final:
A 100-90 B 89-80 C 79-70 D 69-60 E 59-50 F 49-0

Learning outcomes:
Students will be ready for using of problem solving strategies at lower and upper secondary school levels. Clasical problems are studied in more details from different pont of view (students knowledge anmd skills, technologies, motivation, computer modelling and measuremets).

Brief outline of the course:
Methods of problem solving are presented and trained. The sets of typical problems are analysed. Uding of modelling and real experiments is discussed.

Recommended literature:
1.Baláž, P. : Zbierka úloh z fyziky, SPN Bratislava, 1971
2.Bartuška,K: Postup při řešení fyzikálních úloh, Sbírka řešených úloh z fyziky pro střední školy I, Praha, Prometheus, 1997, s. 5-10.
3.Halpern, A.: 3000 solved problems in Physics, McGraw-Hill, Inc., USA, 1988
4.Janovič,J., Koubek,V. Pecen,I.: Vybrané kapitoly z didaktiky fyziky. Bratislava, UK, 1999,
5.Jurčová, M., Dohňanská, J., Pišút, J., Velmovská, K.: Didaktika fyziky – rozvíjanie tvorivosti žiakov a študentov. Bratislava, UK, 2001,
6.Kružík, M.: Sbírka úloh z fyziky pro žáky strědních škol, SPN, Praha, 1984
7.Lindner, H.: Riešené úlohy z fyziky, Alfa, Bratislava, 1973
8.Linhart, J. (1976): In: Volf, I.: Metodika řešení úloh ve výuce fyziky na základní škole. Hradec Králové, MAFY, 1998,
9.Pietrasiński, Z. (1964): In: Volf, I.: Metodika řešení úloh ve výuce fyziky na základní škole. Hradec Králové, MAFY, 1998,

10.Scholtz, E., Kireš, M.: Fyzika – kinematika pre gymnázia s osemročným štúdiom. Bratislava, SPN, 2001,
11.Šedivý,P., Volf, I.: Dopravní kinematika a grafy. Hradec Králové, MAFY, 1998.
12.Volf,I. (1975): In: Bednařík, M., Lepil, O.: Netradiční typy fyzikálních úloh. Praha, PROMETHEUS,1995,
13.Volf,I.: Jak řešit úlohy fyzikální olympiády, XXIII. Ročník soutěze fyzikální olympiády ve školním roce 1981/82, Praha, SPN, 1981,
14.Volf,I.: Metodika řešení úloh ve výuce fyziky na základní škole. Hradec Králové, MAFY, 1998.
15.Halpern, A.: 3000 solved problems in Physics, McGraw-Hill, Inc., USA, 1988
16.http://kekule.science.upjs.sk/fyzika
17.http://physedu.science.upjs.sk

Course language:
Slovak, English

Course assessment
Total number of assessed students: 8

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD., doc. RNDr. Zuzana Ješková, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ MDT06/15	**Course name:** Modern Didactical Technics
Course type, scope and the method: **Course type:** Practice **Recommended course-load (hours):** **Per week:** 2 **Per study period:** 28 **Course method:** present	
Number of credits: 2	
Recommended semester/trimester of the course: 2.	
Course level: II.	
Prerequisities:	
Conditions for course completion: All assignments must be uploaded and accepted be teacher. Active participation at seminar with minimum 80% participation.	
Learning outcomes: Student graduated from subject will be able: - recognise basic tools for teaching activities, - to use all types of actuall tools in science education, - to design and realise educational activities by using modern technologies.	
Brief outline of the course: 1. Didigital teacher`s workspace` 2. Digital imaging 3. Digital image processing 4. Digital audio processing 5. Digital video processing 6. Web cam and videoconferencing systems 7. Interactive didactical system (wideboard, voting system) 8. Computer based measurements 9. Digital technologies in everyday life	
Recommended literature: 1. Kireš, M. et al.: Modern didactical technics in teacher practice, Košice: Elfa, 2010, ISBN 788080861353 2. actuall information from web sites related to didactical technologies, 3. catalogues of teaching tools, 3. actuall articles about modern trends in science education.	
Course language: Slovak, English	
Course assessment Total number of assessed students: 41	

A	B	C	D	E	FX
29.27	48.78	12.2	4.88	4.88	0.0
Provides: doc. RNDr. Jozef Hanč, PhD.					
Date of last modification: 23.02.2017					
Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.					

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ MFDF/15	**Course name:** Modern Physics from Didactics Point of View

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

Number of credits: 3

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
Active participation; completing reading assigments; realization of a chosen modern physics project with a practical application.
Exam and defending own project

Learning outcomes:
1. Achieving better conceptual understanding and getting an integrated view on fundamental ideas of contemprorary modern physics, which every future physicist and physics teacher should have. Emphasis is not on abstract mathematical methods, but on using most recent knowledge and tools of Physics Education Research - computer modeling of physical phenomena and employing only elementary algebra and calculus.
2. Getting physical intuition and experience dealing with practical applications of modern physics.

Brief outline of the course:
1. Fundamental ideas of modern mechanics: symmetry, event, worldlline, spacetime diagram, principle of least action, conservation laws; practical applications.
2. Fundamental ideas of relativity: principle of relativity, space-time interval, conservation of momenergy, metrics, principle of maximal aging; practical applications.
3. Fundamental ideas of quantum mechanics: probability amplitude, principle of democracy of histories, rules for amplitudes, propagator, Schrödinger's equation, stationary state, Feynman's diagrams; practical applications.

Recommended literature:
1. Moore, T. A, Six Ideas That Shaped Physics - Unit C and Q, 2nd ed., Mc Graw Hill, Boston, 2003
2. Feynman, R.P., QED - The Strange theory of Light and Matter, Princeton University Press, Princeton, 1985
3. Hey, A., Walters, P., New Quantum Universe, Cambridge University Press, 2003
4. Taylor, E. F, Wheeler, J. A., Space-time Physics-Introduction to Special Relativity, 2nd ed., W.H. Freeman and Company, New York, 1992
5. Thorne, K. S., Black Holes and Time Warps, W.W. Norton, New York, 1995
6. Relevant resources from recent journal literature (American Journal of Physics, European Journal of Physics, Scientific American...)

Course language:
Slovak

Course assessment
Total number of assessed students: 3

A	B	C	D	E	FX
33.33	33.33	33.33	0.0	0.0	0.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/MPPb/15	**Course name:** Scheduled practice teaching

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 36s
Course method: present

Number of credits: 1

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities: KPE/MPPa/15 and KPE/PDU/15 and (KPPaPZ/PaSPP/09 or KPPaPZ/PPgU/15)

Conditions for course completion:
Student observes 11 physics lessons and leads one own physics lesson under the guidance of a teacher trainer. Confirmation of classroom visits. Written assessment made by teacher trainer.

Learning outcomes:
Students acquire knowledge by observing the practical applications of teaching skills for teaching the subject of physics and getting known about the organization of school work. Studneets gain first experience with teaching the subject of physics.

Brief outline of the course:
Students observe the process of teaching physics at lower and upper secondary schools and analyze it with teacher trainer. Practice takes place continuously durin the course of the semester. Practice is scheduled once a week at the time of the first to third lesson at schools. The first two lessons are obeservation/teaching, the third lesson - analysing the teaching process under the guidance of the teacher trainer.

Recommended literature:

Course language:
Slovak

Course assessment
Total number of assessed students: 61

abs	n
100.0	0.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/MPPc/15	**Course name:** Continuous Practice Teaching I

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities: ÚFV/MPPb/15

Conditions for course completion:
Confirmed list of sittings in on classes and teaching as a confirmation of attendance in the required extent of 6 lessons of sitting in on classes and 18 physics lessons taught by student. Lesson records and written preparation for the lessons.

Learning outcomes:
Student gains under the guidance of teacher trainer practical teaching skills within the subject of Physics.

Brief outline of the course:
Sitting in on classes, teaching physics lessons by student, consulted with teacher trainer, analysis of observed and taught lessons.

Recommended literature:
Textbooks for lower and upper secondary school physics

Course language:
Slovak

Course assessment
Total number of assessed students: 8

abs	n
100.0	0.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/MPPd/15	**Course name:** Continuous Practice Teaching II

Course type, scope and the method:
Course type: Practice
Recommended course-load (hours):
Per week: Per study period: 6t
Course method: present

Number of credits: 2

Recommended semester/trimester of the course: 4.

Course level: II.

Prerequisities: ÚFV/MPPc/15

Conditions for course completion:
Confirmed list of sittings in on classes and teaching as a confirmation of attendance in the required extent of 8 lessons of sitting in on classes and 30 physics lessons taught by student. Lesson records and written preparation for the lessons.

Learning outcomes:
Student gains under the guidance of teacher trainer practical teaching skills within the subject of Physics.

Brief outline of the course:
Sitting in on classes, teaching physics lessons by student, consulted with teacher trainer, analysis of observed and taught lessons.

Recommended literature:
Textbooks for lower and upper secondary school physics

Course language:
Slovak

Course assessment
Total number of assessed students: 4

abs	n
100.0	0.0

Provides: doc. RNDr. Jozef Hanč, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/MSSU/15	**Course name:** Physics and Didactics of Physics

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

Number of credits: 1

Recommended semester/trimester of the course:

Course level: II.

Prerequisities: (ÚFV/DF1a/15 and ÚFV/FKS/15 and ÚFV/SJF1/15 and ÚFV/DF1b/15 and ÚFV/ASFU/15)

Conditions for course completion:
The graduate has knowledge of physics in wider context. He is able to implement and apply knowledge of physics into education. He is able to apply knowledge of theory of education to selected physical content.

Learning outcomes:
Competencies in accordance with the graduate profile.

Brief outline of the course:
The graduate has knowledge of physics in wider context. He is able to implement and apply knowledge of physics content into education. He is able to apply knowledge of theory of education to selected physical content.
Physics:
Selected problems of Solid state physics, Subnuclear physics and Astrophysics.
Didactics of physics:
State educational curriculum ISCED 2,3-Physics. Development of scientific literacy. Physical experiment. Active learning, inquiry-based education in physics. Formative and summative assessment. Talented students and informal education. Analysis of lower and upper secondary teaching units.

Recommended literature:

Course language:
Slovak

Course assessment
Total number of assessed students: 4

A	B	C	D	E	FX
75.0	25.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ PSP1a/05	**Course name:** School Physical Experiments I

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

Number of credits: 2

Recommended semester/trimester of the course: 1.

Course level: II.

Prerequisities:

Conditions for course completion:
continuous written tests
being active in practises
final oral examination

Learning outcomes:
To gain basic skills with demonstration and physics interpretation of school physics experiments belonging to the subject matter in Physics classes at basic schools and high schools. To become familiar with didactic procedures related to using school experiments in different phases of the educational process.

Brief outline of the course:
The practices are aimed at practical realization and physics interpretation of school demonstration experiments from selected topics of the physics subject matter for basic-school and high-school pupils. The emphasis is on familiarizing with teaching aids and didactic devices used in performing school physics experiments and on getting basic skills with their utilization in physics teaching.

Recommended literature:
1.Kašpar,E.,Vachek,J.: Pokusy z fyziky na středních školách, I.díl, SPN Praha,1967
2.Koubek, V. a kol.: Školské pokusy z fyziky, SPN Bratislava, 1992
3.http://physedu.science.upjs.sk/sis/fyzika/experimenty/index.htm

Course language:
Slovak

Course assessment
Total number of assessed students: 68

A	B	C	D	E	FX
44.12	22.06	19.12	7.35	4.41	2.94

Provides: doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., PaedDr. Iveta Štefančínová, Ph.D.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/PSP1b/04

Course name: School Physical Experiments II

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
continuous written tests
being active in practises
final oral examination

Learning outcomes:
Students should gain knowledge and broaden skills necessary for understanding methods, techniques and physical interpretations of all types of school physical experiments that are parts of the subject matter in physics classes at basic and high schools.

Brief outline of the course:
The practises are aimed at practical realization and physics interpretation of school demonstration experiments from selected topics of the physics subject matter for basic- and high-school pupils and their convenient incorporation into educational process. The emphasis is on familiarizing with teaching aids and didactic devices used in performing school physics experiments and on extending skills with their utilization in physics teaching.

Recommended literature:
1.Onderová, Ľ., Kireš, M., Ješková, Z., Degro, J.: Praktikum školských pokusov z fyziky II., PF UPJŠ
2.Kašpar, E., Vachek, J.: Pokusy z fyziky na středních školách, I. díl, SPN Praha, 1967
3.Žouželka,, J., Fuka, J.: Pokusy z fyziky na středních školách, II. díl, SPN Praha, 1971
4.http://physedu.science.upjs.sk/sis/fyzika/experimenty/index.htm

Course language:
Slovak

Course assessment
Total number of assessed students: 64

A	B	C	D	E	FX
51.56	10.94	29.69	4.69	1.56	1.56

Provides: doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., PaedDr. Iveta Štefančínová, Ph.D.

Date of last modification: 23.02.2017
Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ SJF1/15	**Course name:** Subnuclear Physics

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

Number of credits: 2

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
written test and thesis
exam

Learning outcomes:
Preview of basic characteristics and classification of elementary particles, their structures, theoretical description and experimental technique.

Brief outline of the course:
Historical introduction to the particle physics. The forces in nature. Elementary and composite particles..Classification of particles. Symmetrics and conservation laws. Standard model.

Recommended literature:
1. Close F.: The Cosmic Onion - Quarks and the Nature of the Universe, Oxford, 1990.
2. Hajko V. and team of authors, Physics in experiments, Bratislava, 1997.
3. Kapitonov I.M., Vvedenije v fiziku jadra i chastic (Russian), Moscow, 2004.
4. Brandt S., The harvest of a century, Discoveries of modern physics in 100 episodes, Oxford, 2009.

Course language:
Slovak

Course assessment
Total number of assessed students: 31

A	B	C	D	E	FX
32.26	0.0	6.45	25.81	25.81	9.68

Provides: prof. RNDr. Stanislav Vokál, DrSc.

Date of last modification: 20.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ SVKD/04	**Course name:** Student Scientific Conference

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

Number of credits: 4

Recommended semester/trimester of the course:

Course level: II.

Prerequisities:

Conditions for course completion:
presentation of results of studnets´ research work at Students´ scientific conference

Learning outcomes:
Student gains experience and skills in processing and presentation of results of his research work.

Brief outline of the course:
Presentation of results of studnets´ research work at Students´ scientific conference.

Recommended literature:
Based on the recommendations of supervisor

Course language:
Slovak

Course assessment
Total number of assessed students: 45

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides:

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ TRS/15	**Course name:** Special Theory of Relativity

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

Number of credits: 2

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:

Learning outcomes:
To acquaint students with principles of a special theory of relativity.

Brief outline of the course:
Galilean transformations and Galilean principle of relativity. Ether's hypothesis. Michelson experiment. Einstein's principles of the special theory of relativity. Lorentz transformation and its physical consequences. Interval and light cone. Proper time. Minkowski's space-time. Mathematical apparatus of special relativity. Relativistic electrodynamics. Relativistic mechanics.

Recommended literature:
1. Greiner W.: Classical Mechanics-Point Particles and Relativity, Springer-Verlag, New York, 2004.
2. Goldstein H., Poole Ch., Safko J.: Classical Mechanics, Addison Wesley, San Francisco, 2002.
3. Landau L.D., Lifšic E.M.: The Classical Theory of Fields, Pergamon Press, Oxford, 1975.

Course language:
Slovak

Course assessment
Total number of assessed students: 42

A	B	C	D	E	FX
33.33	40.48	9.52	9.52	7.14	0.0

Provides: prof. RNDr. Andrej Bobák, DrSc.

Date of last modification: 21.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ VBF2/15	**Course name:** General Biophysics II

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

Number of credits: 3

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

Course level: II.

Prerequisities:

Conditions for course completion:
Exam

Learning outcomes:
To provide information about the object, significance and role of biophysics in science. The main emphasis will be given on the understanding of the principles determining the structure and function of the most important biological structures (nucleis acids, proteins, biomembranes) as well as on the thermodynamics and kinetics of selected chemical and biophysical processes.

Brief outline of the course:
The definition of biophysics and its role in the science. Intra- and inter-molecular interactions in biological systems. Function and structure of the important biomacromolecules (nucleic acids, proteins, biomembranes, sugars). Conformational transitions in biopolymers: helix-coil transition in DNA, denaturation of proteins, phase transitions in biomembranes.
Thermodynamics of biological processes. Gibbs energy and chemical equilibrium, chemical potential, binding constants of the ligand-macromolecule intractions, cooperativity of the binding between biological important molecules, membrane potential.
Kinetics of the chemical and biophysical processes. The principles of chemical kinetics, enzymatic reactions, inhibition of the enzymes, membrane transport, introduction to the pharmacokinetics.
Cell biophysics. The basic bioenergetic processes, oxidative phosphorylation, photosynthesis. Mechanisms of regulations and control processes in cells-the basic principles.
Medicinal biophysics. Biophysical principles of selected diagnostic and therapeutical methods.
Radiation and environmental biophysics. The influence of physico-chemical factors of the environment on the living systems.

Recommended literature:
1. M. B. Jackson, Molecular and cellular biophysics, Cambridge University Press, 2006.
2. M. Daune, Molecular biophysics-Structures in motion, Oxford University Press, 2004.
3. R. Glaser, Biophysics, Springer Verlag, 2001.
4. M.V. Volkenštein, Biofizika, Nauka, Moskva 1988.
5. W.Hoppe and W. Lohmann, Biophysics, Springer Verlag, 1988.
6. K.E.van Holde, W.C. Johnson and P. Shing Ho, Principles of

physical biochemistry, Simon and Schuster, Prentice Hall, 1998.
7. D.G. Nichols and S.J. Ferguson, Bioenergetics 3, Academic Press, Elsevier Science Ltd., 2002.

Course language:
Slovak

Course assessment
Total number of assessed students: 9

A	B	C	D	E	FX
22.22	44.44	11.11	11.11	11.11	0.0

Provides: doc. Mgr. Daniel Jancura, PhD.

Date of last modification: 24.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice

Faculty: Faculty of Arts

Course ID: ÚFV/ VMV1/15	**Course name:** Using Multimedia in Education

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

Number of credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
9. moduls assignments: 45 points
presentation and discussion about the project 55 points
A 100-90 B 89-80 C 79-70 D 69-60 E 59-50 F 49-0

Learning outcomes:
Studenat will have overview and skills in field of using multimedia in education.

Brief outline of the course:
1. Computer graphics as visualisation tools
2. Preparation and using of graphic elements
3. Computer animation
4. Digital audio and educational activities
5. Educational video
6. Interactive multimedia
7. Videotechnologies in education
8. Computer based school laboratory
9. Interactove acitvites in multimedia classroom
10. Educational project creation
11. Educational project creation
12. Project presentation

Recommended literature:
1. Kireš, M.., Šnajder Ľ., Kalakay, R.: Multimédiá pre učiteľa, Asociácia projektu Infovek, UIPŠ Bratislava 2002, 96 strán, 400 ks, ISBN 80-7098-317-5
2. Kireš, M. a kol.: IKT pre učiteľa fyziky, Asociácia projektu Infovek, UIPŠ Bratislava 2002, 79 strán, 400 ks, ISBN 80-7098-316-7
3. Šnajder, Ľ., Kireš, M.: Práca s multimédiami pre stredné školy, tematický zošit, SPN Bratislava, 2005, 48 strán, 1. vydanie: ISBN 80-10-00422-7, 2006, 1.vydanie maďarská jazyková mutácia: ISBN 80-10-01031-6, 2007, 2.vydanie: ISBN 978-80-10-01224-4

Course language:
Slovak, English

Course assessment

Total number of assessed students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ VPF1/15	**Course name:** Selected General Physics Problems I

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

Number of credits: 3

Recommended semester/trimester of the course: 2.

Course level: II.

Prerequisities:

Conditions for course completion:
1. writing exam 20 points
2. writing exam 20 points
self examples 30 bodov
semestral presentation 30 bodov
A 100-90 B 89-80 C 79-70 D 69-60 E 59-50 F 49-0

Learning outcomes:
Physics interpretationf of everyday phenomena can help with deeper understanding of physics problems.

Brief outline of the course:
1. Kinematics and dynamics
2. Hydrostatics and hydrodynamics
3. Surface properties of liquids
4. Thermics and Thermodynamics
5. Thermics and Thermodynamics II
6. Electrostatics
7. Electric field
8. Magnetic field
9. Mechanical oscillations, resonance, waves
10. Acoustics
11. Ray Optics
12. Wave Optics
13. Student assignments presentation

Recommended literature:
1.Nahodil, J.: Fyzika v bežnom živote, Prometheus, Praha, 1996
2.Tulčinskyj, : Zbierka kvalitatívnych úloh z fyziky, SPN, Bratislava, 1990
3.Kašpar, E. : Problémové vyučovanie a problémové úlohy, SPN, Praha1982
4.Feynman, R.P. : Feynmanove prednášky z fyziky 1-5, Alfa, 1985
5.Landau, Kitajgorodskij : Fyzika pre každého, Alfa 1972
6.Lange, V.: To chce vtip!, Alfa, Bratislava, 1988
7.http://kekule.science.upjs.sk/fyzika

8.http://physedu.science.upjs.sk

Course language:
Slovak, English

Course assessment
Total number of assessed students: 6

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ VPF2/15	**Course name:** Selected General Physics Problems II

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

Number of credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
presentation of selected problem 30 p
writing exam 70 p
A 100-90 B 89-80 C 79-70 D 69-60 E 59-50 F 49-0

Learning outcomes:
Everyday phenomena are used for deeper and conceptual understanding of physics problem.

Brief outline of the course:
1.Mechanics
•Coriolisova force
•How Swing works
•Bicycle
•Tides
•Inertia
2.Hydromechanics
•Archimedes screw
•Water flow
•Archimedes principle in Action
3.Kapilarity
•Water in plant
•Kapilár hysteresis
•Bubbles and soap
•Floating on water surface
4.Acoustic
•Signal production
•Human voice
•Space acoustic
•Home ciname
5.Optics
•Sight
•Opticalillusions
•Space imaging

•Atmospheric acoustic
6.Probléms IYPT
•Magnetohydrodynamics
•Bulbs
•Falling spring
•Ship movement
•Thermal exchange
7.Differenct problems
•Sonoluminiscence
•Ice pick
•Kelvin water droplet
•Water stain
8.Student work presentation

Recommended literature:

1. Walker, J.: The Flying Circus of Physics with answers, John Wiley &Sons, 2005
2. Gnädig, P., Honyek, G., Riley, K.: 200 Puzzling Physics Problems with Hints and Solutions, Cambridge University Press, 2001
3. Stepans, J.: Targeting Studnets ` Misconceptions, Showboard, 2003
4. Swartz, C.: Back of the Envelope Physics, The John Hopkins Uni. Press, Baltimore, 2003
5. Nahodil, J.: Fyzika v bežnom živote, Prometheus, Praha, 1996
6. Tulčinskyj, : Zbierka kvalitatívnych úloh z fyziky, SPN, Bratislava, 1990
7. Kašpar, E. : Problémové vyučovanie a problémové úlohy, SPN, Praha1982
8. Feynman, R.P. : Feynmanove prednášky z fyziky 1-5, Alfa, 1985
9. Landau, Kitajgorodskij : Fyzika pre každého, Alfa 1972
10. Lange, V.: To chce vtip!, Alfa, Bratislava, 1988
actual articles

Course language:
Slovak, English

Course assessment
Total number of assessed students: 4

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Marián Kireš, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.

COURSE INFORMATION LETTER

University: P. J. Šafárik University in Košice	
Faculty: Faculty of Arts	
Course ID: ÚFV/ VPSP/04	**Course name:** School Physics Experiments III

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

Number of credits: 3

Recommended semester/trimester of the course: 3.

Course level: II.

Prerequisities:

Conditions for course completion:
continuous written tests
active work in practises
final oral examination

Learning outcomes:
The students gain skills and competencies to the own and effective organisation and solving of experimental tasks, use of activities enhanced by digital technologies for physics teaching at lower and upper secondary level.

Brief outline of the course:
The practices are aimed at practical realization and physics interpretation of different forms of selected school demonstration. The emphasis is on creative utilization of teaching aids and didactic devices and computer-aided experiments.

Recommended literature:
Šucha, J.: Metodická príručka pre rozkladný transformátor, Učebné pomôcky B.Bystrica, 1973
Demkanin, P. a kol. Počítačom podporované prírodovedné laboratórium, FMFI UK Bratislava, 2006, ISBN:80-89186-10-6
Ješková, Z., a kol. Využitie informačných a komunikačných technológií v predmete Fyzika pre stredné školy : učebný materiál - modul 3. - 1. vyd. - Košice : Elfa, 2010. - 242 s., ISBN 978-80-8086-146-9
Duľa, I. a kol. Využitie informačných a komunikačných technológií v predmete Fyzika pre základné školy : učebný materiál - modul 3. - 1. vyd. - Košice : Elfa, 2010. - 240 s., ISBN 978-80-8086-154-4
Ješková, Z., Degro, J., Onderová, Ľ.: Počítačom podporovaná výučba fyziky, PF UPJŠ, Košice, ISBN 80 - 7097 - 451 -6
http://physedu.science.upjs.sk/sis/fyzika/experimenty/index.htm

Course language:
Slovak

Course assessment
Total number of assessed students: 2

A	B	C	D	E	FX
0.0	100.0	0.0	0.0	0.0	0.0

Provides: doc. RNDr. Zuzana Ješková, PhD., doc. RNDr. Marián Kireš, PhD., RNDr. Ľudmila Onderová, PhD.

Date of last modification: 23.02.2017

Approved: Guaranteeprof. RNDr. Peter Kollár, DrSc.Guaranteeprof. PhDr. Oľga Orosová, CSc.