University of Pécs (UP)

Medical School's (MS),
Faculty of Pharmacy's (FP),
ongoing doctoral (PhD) training

optional PhD courses in the 2024-2025 school year

PÉCS

2024

CHOOSABLE PHD COURSES
IN THE 2024-2025
SCHOOL YEAR

The list contains the announced courses of all the accredited programs of the UP MS/FP, sorted by the instructors' names. All PhD students can apply (state scholarship holders, correspondence students and individually preparing students).

The "code number" system is used to identify courses belonging to the same program group, maintaining the order sorted by the names of the leading course instructors. The registry published in the appendix is applicable for the collation of the code numbers and programs.

Detailed descriptions of the PhD courses can be found on the UP MS/FP website https://aok.pte.hu/hu/egyseg/1670/index/almenu/756.

Choosing courses is based on the reconciliation with the topic leaders.

I kindly ask everyone to contact the chosen instructors as soon as possible; you have to come to agreement with them about the details personally. There are no strict class schedules; each instructor comes to terms with each student individually.

Registrations for the courses happen at the course leaders.
Deadline: 6th September 2024.

Dr. Rékási, Zoltán
PhD secretary
(telephone: 36101, 36104, 36103, 31824)

code	instructor in charge	title	credit	host department
OPKI_B-2/2014_ABH1	**Dr. Ábrahám, Hajnalka**	The hippocampus and its role in temporal lobe epilepsy	2	Department of Biology
description	The lectures deal with the role of the hippocampus and the temporal lobe structures connected to it in the epileptogenesis. Lectures will discuss the information, the morphology, connections, development of the hippocampus and the morphological and functional changes of it in temporal lobe epilepsy. Topics include the animal models of temporal lobe epilepsy and on the basis of them developed theories of epileptogenesis.			

Declaration of the course:

Semester: spring
Application deadline: 02. 05.
Application: **name:** Dr. Ábrahám, Hajnalka
telephone: 36216
email: hajnalka.abraham@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Timeframe of education total hours of the course: 14
number of lectures per week: 2

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: attendance of 80% of the classes, to reach 70% of the scores and the exam
Opportunities for making up for non-attendance: no

List of resources (book, note, other) **required for learning the curriculum:** we will handle out the relevant literature
Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:

1. The anatomy and connections of the hippocampus (dr. Ábrahám Hajnalka)
2. Structure of the archicortex and neocortex (dr. Ábrahám Hajnalka)
3. Prenatal development of the hippocampus (dr. Ábrahám Hajnalka)
4. Postnatal morphological and functional developemnt of the hippocampus. (dr. Ábrahám Hajnalka)
5. Diagnosis, differential diagnosis of the temporal lobe epilepsy. Meisal temporal sclerosis. The role of febrile seizure (dr. Janszky József)
6. Visualisation of hippocampal functions with fMRI. (dr. Janszky József)
7. Morphological changes in the hippocampus in temporal lobe epilepsy I. Cell death (dr. Ábrahám Hajnalka)
8. Morphological changes in the hippocampus in temporal lobe epilepsy II. Synaptic reorganization (dr. Ábrahám Hajnalka)
9. Morphological changes in the temporal archicortex. (dr. Ábrahám Hajnalka)
10. Morphological changes in the temporal neocortex. (dr. Ábrahám Hajnalka)
11. Examination of impairments of verbal memory and spatial navigation. (dr. Karádi Kázmér)
12. Functional changes in temporal lobe epilepsy. (dr. Karádi Kázmér)
13. Animal models of temporal lobe epilepsy. (dr. Ábrahám Hajnalka)
14. Theories of epileptogenesis. Test. (dr. Ábrahám Hajnalka)

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_BAM1	**Dr. Balaskó, Márta**	Pathophysiological mechanisms of the development, prevention and treatment of obesity.	2	Institute for Translational Medicine
description	The aim of the course is to analyze the regulatory alterations in the background of juvenile and middle-aged obesity observed in humans and other mammals. Obesity-induced long-term regulatory alterations in energy metabolism, pathophysiological mechanisms of preventive and therapeutic methods are discussed. During the course, results of animal studies and human observations are discussed and critically analyzed. In addition to the thorough analysis of the literature, animal experiments regarding the complex study of energy balance, also involving spontaneous physical activity (running wheels) and treadmill training will also be carried out.			

Declaration of the course:

Semester: spring
Application deadline: 01-30th September
Application: **name:** dr. Balaskó, Márta
telephone: +36-72-536-246
email: marta.balasko@aok.pte.hu

Maximum number of attending students: 5-7
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14 (7 x 2 x 45 min)
number of practices per week: 1
number of seminars per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: 3 x 45 min)
Opportunities for making up for non-attendance: Summarizing essay (2-3 pages) on the topic of the missed seminar or practice

List of resources (book, note, other) **required for learning the curriculum:**
Powerpoint presentations used in the seminars, review articles on the topics
Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Epidemiology and consequences of obesity in humans and in laboratory rodents. Gender differences. Experimental methods of the complex study of energy balance. (Dr. Márta Balaskó)
2. Age-related regulatory alterations in energy balance in diet-induced obese (DIO) and diet-induced obesity-resistant (DR) rodents. Animal models. (Dr. Erika Pétervári)
3. Obesity-induced short- and long-term regulatory alterations in the energy balance in laboratory rodents and humans. Their importance in the development and maintenance of metabolic syndrome. (Dr. Szilvia Soós)
4. The effects of pre- and neo-natal over- or under-nutrition on regulatory processes of energy balance, on peripheral metabolism, on functions of the central nervous system in rodents. Evaluation of human observations. (dr. Márta Balaskó)
5. Methods of prevention and/or treatment of obesity: forms and pathophysiological mechanisms of caloric restriction in rodents and humans. (dr. Erika Pétervári)
6. Methods of prevention and/or treatment of obesity: forms and pathophysiological mechanisms of physical activity in rodents and humans. Experimental methods. (dr. Márta Balaskó).
7. Possible corrections of short-term and long-term obesity-induced peptidergic regulatory alterations in experimental rodent models. Potential future treatment strategies of obesity. (dr. Erika Pétervári)

code	instructor in charge	title	credit	host department
OPEL_B-139/1993_BET1	**Dr. Berki, Tímea**	Laboratory immune techniques in molecular biology research	6	Department of Immunology and Biotechnology
description	The aim of the course is to introduce, at skill level, the main immunological techniques frequently used in molecular biology research. The newest and most important methods will be covered during the 5x8 hours of practice with active participation of the students. Besides the classical cellular immunologic and immunoserologic techniques, the new possibilities in cellular and molecular immunology and modern molecular biological applications will also be introduced.			

Declaration of the course:

Semester: autumn
Application deadline: October 1st
Application: **name:** Erdő-Bonyár, Szabina
telephone: 36288
email: erdo-bonyar.szabina@pte.hu

Maximum number of attending students: 20

Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 40
number of practices per week: 5 x 8

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course: active participation in the practices, maximum 3 hours absent

Opportunities for making up for non-attendance: individual make up

List of resources (book, note, other) **required for learning the curriculum:**
Abul K. Abbas: Cellular and Molecular Immunology 9th ed. 2018
Immunology journals

Topics and instructors of the activities (all lectures, practices, seminars separately):
Péter Németh (PN), Péter Balogh (PB), Tímea Berki (TB), Ferenc Boldizsár (FB), Diána Simon (SD), Péter Engelmann (PE),

PhD Course schedule:
Monday

Introduction.
Monoclonal and polyclonal antibodies.
Immunization, hybridoma technique.
Antibody purification and storage.
Antibody modifications: radioactive isotope isotope labeling, colloid gold labeling, enzymatic labeling,
fluorescent labeling, avidin-biotin system
Immunocytochemistry, immunohistochemistry, fluorescent microscopy, confocal microscopy
Immunohistochemistry practice.

Tuesday

Haemagglutination, Coombs-test.
Nephelometry, turbidimetry.
ELISA, RIA.
Routine diagnostics, automatization.
Immunodiffusion, immunoelectrophoresis.
Dot blot, Westen blot.
Immunoprecipitation.
ELISA routine diagnostic practice.

Wednesday

Molecular DNA techniques and their immunologic applications I.
Phage display and its applications in immunology.
Molecular biology practice.

Thursday

Significance of cell surface CD markers. Flow cytometry.
Cell surface and intracellular staining for flow cytometry.
New possibilities in flow cytometry.
CBA technique.
Flow cytometry practice.

Friday

Molecular DNA techniques and their immunologic applications II.
Lentiviral vectors.
RNA interference and its application areas.
Consultation
Exam

code	instructor in charge	title	credit	host department
OPEL_B-139/1993_BET2	**Dr. Berki, Tímea**	New trends in molecular and cellular immunology	4	Department of Immunology and Biotechnology

description	The aim of the course is the presentation and discussion of the newest advances and results of immunology, immunobiology and related research areas. Researchers of the department, together with invited lecturers will give weekly seminars where hot topics of immunology will be covered and discussed (e.g. immunological tolerance, recognition of self vs. non-self, physiologic and pathologic autoimmunity, lymphoid cell differentiation in diseases, animal models etc).

Declaration of the course:

Semester: spring
Application deadline: February 14
Application: **name:** Erdő-Bonyár, Szabina
telephone: 36288
email: erdo-bonyar.szabina@pte.hu

Maximum number of attending students: 20
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 28
number of lectures per week: 1
number of seminars per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course: maximum 3 absences, successful exam
Opportunities for making up for non-attendance: none

List of resources (book, note, other) **required for learning the curriculum:**
Abul K. Abbas: Cellular and Molecular Immunology 9th edition 2018
Immunology journals

Topics and instructors of the activities (all lectures, practices, seminars separately):
The exact schedule with lectures will be announced at the beginning of the semester.
Lecturers: Péter Németh, Péter Balogh, Tímea Berki, Ferenc Boldizsár, Diána Simon, Péter Engelmann, József Najbauer, invited lecturers

code	instructor in charge	title	credit	host department
OPMU_B-130/1993_BUB1	**Dr. Bugyi, Beáta**	Fluorescence microscopic approaches in biological sciences	2	Department of Biology
description	The aim of the course is to provide extensive knowledge for the principles and applications of basic and most advanced fluorescence microscopic approaches used in biological sciences. Special applications and their pros and cons will be discussed. The practicals are designed to gain strong experience in handling modern research microscopes, sample preparation and image analysis.			

Declaration of the course:

Semester: spring
Application: **name:** dr. Bugyi, Beáta
telephone: 36216
email: beata.bugyi@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 1
number of practices per week: 1

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: No more than 2 absences and successful exam.
Opportunities for making up for non-attendance: Discussed with the course's instructor in charge.

List of resources (book, note, other) **required for learning the curriculum:** The educational material will be provided by the lecturers.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:
Basics of light microscopy (1 hour)
Fluorescence microscopy (1 hour)
Confocal microscopy (1 hour)

Advanced microscopic approaches: total internal reflection fluorescence microscopy (TIRFM), stimulated emission depletion microscopy (STED), two-photon microscopy, structured illumination microscopy (SIM), single molecule localization microscopy (1 hour)
Advanced microscopic approaches: FRAP, FRET, FLIM (1 hour)
Image analysis (2 hours)

Practicals:
Basics of light microscopy (2 hours)
Advanced microscopic approaches: TIRFM, SIM (2 hours)
Image analysis (3 hours)

code	instructor in charge	title	credit	host department
OPMU_B-130/1993_BUB2	**Dr. Bugyi, Beáta**	Fundamental laboratory mathematics	4	Department of Biology
description	The aim of the course is to provide math skill essential for the laboratory analysis and reduce the anxieties math often induces. The course provides extensive knowledge of the mathematical principles and applications of basic and most advanced laboratory calculations. Case studies and real-world examples are discussed. Special emphasis is led to acquire skills of the use of Excel.			

Declaration of the course:

Semester: autumn
Application: **name:** dr. Bugyi, Beáta
telephone: 36216
email: beata.bugyi@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 28
number of lectures per week: 2

Type of examination: written

Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).:
No more than 3 absences and successful exam.

Opportunities for making up for non-attendance: Discussed with the course's instructor in charge.

List of resources (book, note, other) **required for learning the curriculum:**
The educational material will be provided by the lecturers.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. unit (4 hours) Excel functions
2. unit (4 hours) Algebra, solutions, dilutions
3. unit (4 hours) Functions, graphs, standard curves
4. unit (12 hours) Quality assessment and control, statistical analysis
5. unit (4 hours) Sampling, simulation techniques

Instructors: Dr. Beáta Bugyi, Leipoldné Dr. Andrea Teréz Vig, Dr. Péter Gaszler

code	instructor in charge	title	credit	host department
OPKI-B-3/2014_CZB1	**Dr. Czéh, Boldizsár**	Stress: From molecules to behavior. The biology of stress response, pathological consequences and coping mechanisms.	2	Institute of Laboratory Medicine

description	The presence of stress in our civilized societies is continuously increasing. The aim of this course is to define the concept of stress and to discuss the biology of stress response and it's physiological and psychological consequences. Experiencing traumatic or chronic stress at different periods in our life can have long term consequences on our development and adult health (physical and psychological). We also deal with various somatic and neuropsychiatric disorders that can develop as a consequence of stress. Finally, we discuss and practice potential coping strategies.

Declaration of the course:

Semester: spring
Application deadline: 1st of February
Application: **name:** Dr Czéh, Boldizsár
telephone: 29151
email: **czeh.boldizsar@pte.hu**

Maximum number of attending students: 12
Criteria of acceptance in case of overbooking: order of application, declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 2
number of practices per week: 2 practices at the end of the course
Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: The result of the exam should be better than 60%. One can be absent for a maximum of 2 hours.
Opportunities for making up for non-attendance: Self learning.

List of resources (book, note, other) **required for learning the curriculum:**
Lucassen PJ et al.: **Neuropathology of stress. Acta Neuropathol**. 2014 Jan;127(1):109-35. doi: 10.1007/s00401-013-1223-5.
Koolhaas JM et al.: **Stress revisited: a critical evaluation of the stress concept**. Neurosci Biobehav Rev. 2011 Apr;35(5):1291-301. doi: 10.1016/j.neubiorev.2011.02.003.
Robert M. Sapolsky: **Why Zebras Don't Get Ulcers. (Paperback book)**
Elizabeth Lasley and Bruce S. McEwen: **The End of Stress As We Know It. (Hardcover book).**

Lectures:
1) The concept of stress. Neuro-hormonal regulation of the stress response and key molecules in the stress response
2) Stress research in basic science and clinical practice. (Animal models, current topics).
3) Early stress and long term consequences on health and disease.
4) Somatic and neuropsychiatric consequences of stress. I.
5) Somatic and neuropsychiatric consequences of stress. II. (Dr Maria Simon)
6) Treatments strategies and coping with stress. (Dr Maria Simon)
Practices:
Coping strategies in practice. (Dr Maria Simon)

code	instructor in charge	title	credit	host department
OPGY_B-1/2004_DAS1	**Dr. Das, Sourav**	Advanced Cell Culture Techniques: From Lab Design to Scale-up Solutions	4	Pharmaceutical Technology and Biopharmacy
description	This course covers the essential techniques from lab design to advanced applications. The students will learn about safety protocols, media preparation, and quality control measures. With a focus on scalability and innovation, this course equips learners with the skills needed for successful cell culture experiments in various research settings.			

Declaration of the course:

Semester: both
Application deadline: 01 October / 01 February
Application: name: dr. Das, Sourav
telephone: 28803 / 29249
email: sourav.das@pte.hu

Maximum number of attending students: 10

Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education: total hours of the course: 28
number of lectures per week: 02 (each lecture is for 1 + 1 hour)

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: Attendance of 80% of the classes, to reach 70% of the scores and the exam

Opportunities for making up for non-attendance: No

List of resources (book, note, other) **required for learning the curriculum:** Class notes and materials issued during the semester

Topics and instructors of the activities (all lectures, practices, seminars separately):
(The duration of each lecture is 1 + 1 hour on each occasion.)
1. Introduction to Fundamental Cell Culture Techniques
2. Laboratory Design and Equipment Selection
3. Microbiological Safety Measures in Cell Culture
4. Cell Culture Media Preparation and Handling
5. Safety Protocols for Cell Culture Operations
6. Sourcing and Authentication of Cell Lines
7. Case studies I / written exam I
8. Cryopreservation Techniques and Storage Considerations
9. Quality Control Procedures in Cell Culture
10. Risk Assessment and Contamination Prevention
11. Authentication Methods for Cell Lines
12. Exploring 3D Cell Culture Techniques
13. Alternative Cell Culture Systems and Scale-up Solutions
14. Case studies II / written exam II

code	instructor in charge	title	credit	host department
OPGY_B-1/2004_DAS2	**Dr. Das, Sourav**	Techniques in High Throughput Screening (HTS) for Biomedical Analysis	4	Pharmaceutical Technology and Biopharmacy
description	Upon completion, students will possess the necessary skills to contribute effectively to HTS research and drug discovery endeavors, gaining proficiency in conducting screening assays using fluorescent and colorimetric methods, operating microplate readers, and analyzing HTS data while also understanding ethical considerations and the significance of collaboration in laboratory environments.			

Declaration of the course:

Semester: both
Application deadline: 01 October / 01 February
Application: name: dr. Das, Sourav
telephone: 28803 / 29249
email: sourav.das@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
number of lectures per week: 02 (each lecture is for 1 + 1 hour)

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: Attendance of 80% of the classes, to reach 70% of the scores and the exam
Opportunities for making up for non-attendance: No

List of resources (book, note, other) **required for learning the curriculum:** Class notes and materials issued during the semester

Topics and instructors of the activities (all lectures, practices, seminars separately):
(The duration of each lecture is 1 + 1 hour on each occasion.)
1. HTS fundamentals in biomedical analysis
2. Practical fluorescent screening assays
3. Multiparametric colorimetric assays for drug discovery
4. Advanced fluorescent techniques
5. Proficiency in microplate operations
6. Data analysis and interpretation skills
7. Case studies I / Written exam I
8. Integration of HTS for drug evaluation
9. Applications in drug discovery and toxicology
10. Ethical considerations in HTS research
11. Critical thinking in experimental design
12. Effective collaboration in lab settings
13. Clear communication of research findings
14. Case studies II / Written exam II

code	instructor in charge	title	credit	host department
OPKL_B-2/2004_FAR1	**Dr. Faludi, Réka**	Novel echocardiographic techniques for clinical practice and research	2	Heart Institute

description	In addition to the classical, widespreadly used echocardiographic methods, several new, special techniques have been developed during the last years helping to understand the work of the human heart. Some of these techniques are already involved in our clinical practice while the others are used for research purposes only. The aim of the course is to present the theoretical background and the practical aspects of these new techniques.

Declaration of the course:

Semester: autumn
Application deadline: 15 September
Application: **name:** dr. Faludi, Réka
telephone: 72/536-001/35626
e-mail: faludi.reka@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 1x2

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: participating in min. 70 % of all lectures, successful exam
Opportunities for making up for non-attendance: personal consultation

List of resources (book, note, other) **required for learning the curriculum:**
W.F. Armstrong, T. Ryan: Feigenbaum's Echocardiography 7th edition, 2010

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Tissue Doppler imaging (Réka Faludi)
2. Basics of cardiac resynchronisation therapy (Ilona Goják)
3. Myocardial strain and strain rate (Réka Faludi)
4. Investigation of the myocardial torsion (Réka Faludi)
5. Particle Image Velocimetry: visualisation of the intracardiac flow pattern (Réka Faludi)
6. 3D echocardiography (Réka Faludi)
7. Practice (Réka Faludi)

code	instructor in charge	title	credit	host department
OPGY_A-148/1993_FAÁ1	**Dr. Farkas, Ágnes**	Morphology, physiology and taxonomic significance of pollen	4	Department of Pharmacognosy

description	The course focuses on fields of palynology that are significant in medical and pharmaceutical sciences, public health, forensic sciences and agriculture. The theoretical

	part provides an overview of pollen development, morphology and dispersal units. A section will be devoted to the background of pollen allergy, the monitoring of airborne pollen and spores, and the plant species that produce allergenic pollen in various seasons. Emphasis will be laid on the microscopic identification of various pollen types, which can be significant both in combatting pollen allergy, analysing honey samples and in forensic palynology.

Declaration of the course:

Semester: spring
Application deadline: 4th week of spring semester
Application: **name:** dr. Farkas, Ágnes
telephone: 28822
email: agnes.farkas@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
The course will be held in a single week, with 10 lecture classes, 6 seminars and 12 practice classes.

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: Students can be absent from 15% of the classes. Students will be required to perform all practical tasks and prepare a lab notebook. Students have to hand in an assignment, which provides detailed analysis of the microscopic characters of pollen grains in a plant taxon or various honey samples.
Opportunities for making up for non-attendance: Personal consultation is possible.

List of resources (book, note, other) **required for learning the curriculum:**

- Shivanna K.R. Pollen Biology and Biotechnology. Science Publishers Inc., Enfield, NH, USA, 2003.
- Hesse M., Halbritter H., Zetter R., Weber M., Buchner R., Frosch-Radivo A., Ulrich S. Pollen Terminology. Springer, Wien, New York, 2009.
- Halbritter H., Weber M., Zetter R., Frosch-Radivo A., Buchner R., Hesse M. PalDat - Illustrated Handbook on Pollen Terminology. University of Vienna, Vienna, 2005.
- Dafni A., Kevan P.G., Husband B.C. (Eds.) Practical Pollination Biology. Enviroquest Ltd., Cambridge, Ontario, Canada, 2005.
- www.paldat.org

Topics and instructors of the activities (all lectures, practices, seminars separately):

Lectures:

1.	Palynology and its fields	Dr. Ágnes Farkas
2.	Development of pollen grains	Dr. Ágnes Farkas
3.	Dispersal units of pollen	Dr. Ágnes Farkas
4.	Size, polarity, shape and symmetry of pollen and spores	Dr. Ágnes Farkas
5.	NPC system, aperture types	Dr. Ágnes Farkas
6.	Structure of the pollen wall, surface of the pollen grain	Dr. Ágnes Farkas
7.	Physiology of pollen	Dr. Ágnes Farkas
8.	Pollen allergy	Dr. Ágnes Farkas
9.	Pollen calendar. Main allergens of each pollen season.	Dr. Ágnes Farkas
10.	Management of symptoms of pollen allergy	Dr. Ágnes Farkas

Seminars:

1.	Light and electron microscopic examination of pollen	Dr. Ágnes Farkas
2.	Taxonomic significance of pollen, pollen identification keys	Dr. Ágnes Farkas
3.	Using internet databases and websites related to pollen	Dr. Ágnes Farkas
4.	Using internet databases and websites related to pollen	Dr. Ágnes Farkas
5.	Pollen traps, analysis of samples	Dr. Ágnes Farkas
6.	Pollen traps, analysis of samples	Dr. Ágnes Farkas

Practices:

1.	Pollen viability studies with different methods	Dr. Ágnes Farkas
2.	Pollen viability studies with different methods	Dr. Ágnes Farkas
3.	Light microscopic study of pollen grains of various plant taxa	Dr. Ágnes Farkas
4.	Light microscopic study of pollen grains of various plant taxa	Dr. Ágnes Farkas
5.	Light microscopic study of pollen grains of various plant taxa	Dr. Ágnes Farkas
6.	Light microscopic study of pollen grains of various plant taxa	Dr. Ágnes Farkas
7.	Light microscopic analysis of samples from pollen traps	Dr. Ágnes Farkas
8.	Light microscopic analysis of samples from pollen traps	Dr. Ágnes Farkas
9.	Preparing pollen samples from honeys for microscopic analysis	Dr. Ágnes Farkas
10.	Preparing pollen samples from honeys for microscopic analysis	Dr. Ágnes Farkas
11.	Light microscopic study of honey pollen samples	Dr. Ágnes Farkas
12.	Light microscopic study of honey pollen samples	Dr. Ágnes Farkas

code	instructor in charge	title	credit	host department
OPGY_A-148/1993_FAÁ2	**Dr. Farkas, Ágnes** **Dr. Kocsis, Marianna**	Plant microtechniques	4	Department of Pharmacognosy, FS, Institute of Bilogy
description	The course focuses on the most frequently applied plant microtechniques, used to study various plant tissues and cells, particularly in the case of medicinal plants. After providing the theoretical background, students will master the microscopic techniques applied in the study of (medicinal) plants during laboratory practices, starting from sampling through analyzing fresh plant samples and processing fixed samples, to microscopic analyses, measurements and appropriate documentation.			

Declaration of the course:

Semester: **spring**
Application deadline: 4th week of the spring semester
Application: **name:** dr. Farkas, Ágnes
telephone: 28822
email: agnes.farkas@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
The classes will be held in a single week, which suits all the students. The course will include 4 lecture classes, 2 seminars and 22 practice classes.

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: Students can be absent from 15% of classes. Students are required to actively participate in the course, and they can master various techniques by working with plant samples related to their own research or samples provided by course instructors. Students have to prepare a lab notebook, which will be evaluated by course instructors.
Opportunities for making up for non-attendance: Personal consultation is possible.

List of resources (book, note, other) **required for learning the curriculum:**

- Ruzin Steven E.: Plant microtechnique and microscopy. Oxford University Press, New York, Oxford, 1999.
- Yeung E.C.T, Stasolla C., Sumner M.J., Huang B.Q. (eds): Plant Microtechniques and Protocols, Springer, 2015
- Kocsis M.: Plant Microtechniques – electronic course material, Pécs, 2019
- handouts provided by course instructors

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:

1.	Techniques of leaf clearing	Dr. Ágnes Farkas
2.	Conserving and fixing of plant samples. Embedding and sectioning	Dr. Ágnes Farkas
3.	Light and fluorescent microscopic dyes	Dr. Marianna Kocsis
4.	Light microscope, fluorescent microscope	Dr. Marianna Kocsis

Seminars:

1.	Fluorescent microscopy	Dr. Marianna Kocsis
2.	Taking digital microphotos, microscopic measurements	Dr. Marianna Kocsis

Practices:

1.	Leaf clearing with short method (chemical + heat treatment)	Dr. Ágnes Farkas
2.	Leaf clearing with long (cold) method 1	Dr. Ágnes Farkas
3.	Leaf clearing with long (cold) method 2	Dr. Ágnes Farkas
4.	Conserving plant samples	Dr. Ágnes Farkas
5.	Dehydration of plant samples	Dr. Ágnes Farkas
6.	Embedding of plant samples into paraplast	Dr. Ágnes Farkas
7.	Embedding of plant samples into artificial resin	Dr. Ágnes Farkas
8.	Mounting of blocks	Dr. Ágnes Farkas
9.	Sectioning of embedded samples with rotation microtome	Dr. Ágnes Farkas
10.	Sectioning of embedded samples with rotation microtome	Dr. Ágnes Farkas
11.	Staining and mounting of sections	Dr. Ágnes Farkas
12.	Staining and mounting of sections	Dr. Ágnes Farkas
13.	Examining various plant organs on permanent preparations	Dr. Marianna Kocsis
14.	Qualitative and quantitative analysis of leaf cross sections with light microscopy	Dr. Marianna Kocsis
15.	Staining and processing of leaf samples for fluorescent microscopy	Dr. Marianna Kocsis
16.	Microlocalization of flavonoids in leaf tissues	Dr. Marianna Kocsis
17.	Taking microphotos, qualitative and quantitative analysis of micrographs	Dr. Marianna Kocsis
18.	Staining flower preparations, processing them for fluorescent microscopy	Dr. Marianna Kocsis
19.	Observation of flower parts, pollen grains and pollen tubes with fluorescer microscopy	Dr. Kocsis Marianna
20.	Studying pollination and fertilization with fluorescent microscope	Dr. Kocsis Marianna
21.	Qualitative and quantitative analysis of micrographs	Dr. Kocsis Marianna
22.	Summing up and evaluating results	Dr. Kocsis Marianna

code	instructor in charge	title	credit	host department
OPKI_B-1/2005_FEG1	**Dr. Fehér, Gergely**	The effect of chronic pain on work capacity	2	Centre for Occupational Medicine

description	Chronic pain can be difficult for single provider to manage in a busy clinical setting. In this course, we discuss etiology and pathophysiology of chronic pain, along with variables that impact the severity of chronic pain and functional loss, focusing on work ability.

Declaration of the course:

Semester: both
Application deadline: 01/09/ and 01/02/
Application: **name:** dr. Fehér, Gergely
telephone: 72/507-523
email: feher.gergely@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of seminars per week: 2

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: Participation over 70%, passing the oral exam
Opportunities for making up for non-attendance: in accoradance with the instructor

List of resources (book, note, other) **required for learning the curriculum:**
Adams and Victor's Principles of Neurology 10th Edition
Diabetic neuropathies: diagnosis and management.
Deli G, Bosnyak E, Pusch G, Komoly S, Feher G.
Neuroendocrinology. 2013;98(4):267-80.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1st week. Gergely Feher: Neuranatomy of pain
2nd week. Gergely Feher: Nociceptive pain
3rd week. Gergely Feher: Neuropathic pain
4th week. Gergely Feher: Treatment strategies in chronic pain
5th week. Antal Tibold: The effect of pain on working ability
6th week. Gabriella Pusch: Chronic pain hurts the brain
7th week. Gergely Feher: Summary, case-reports

code	instructor in charge	title	credit	host department
OPKI_B-1/2005_FEG2	**Dr. Fehér, Gergely**	The effect of cerebrovascular diseases on working capacity	2	Centre for Occupational Medicine

description	Stroke is the leading cause of disability and one of the main causes of death worldwide. In this course, we discuss etiology and pathophysiology of stroke, along with variables that impact the acute and chronic management, focusing on work ability.

Declaration of the course:

Semester: both
Application deadline: 01/09/ and 01/02/9
Application: **name:** dr. Fehér, Gergely
telephone: 72/507-523
email: feher.gergely@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of seminars per week: 2

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: Participation over 70%, passing the oral exam
Opportunities for making up for non-attendance: in accoradance with the instructor

List of resources (book, note, other) **required for learning the curriculum:**
Adams and Victor's Principles of Neurology 10th Edition
Statintherapy in the primary and the secondary prevention of ischaemic cerebrovascular diseases.
Feher A, Pusch G, Koltai K, Tibold A, Gasztonyi B, Szapary L, Feher G.
Int J Cardiol. 2011;148(2):131-8.
Topics and instructors of the activities (all lectures, practices, seminars separately):
1st week. Gergely Feher: Neuranatomy of stroke
2nd week. Gergely Feher: Stroke syndromes
3rd week. Gergely Feher: Acute stroke management
4th week. Gergely Feher: Secondary stroke prevention
5th week. Antal Tibold: The effect of stroke on working ability
6th week. Gabriella Pusch: Post stroke pain, fatigue and depression
7th week. Gergely Feher: Summary, case-reports

code	instructor in charge	title	credit	host department
OPKI_B-1/2005_FEG3	**Dr. Fehér, Gergely**	Complex approach to digital addictions	2	Centre for Occupational Medicine
description	As a result of digitalisation and the increasing use of the internet, its problematic use is on the rise in the 21st cen-tury, with a predominant impact on minors and a potentially increasing challenge for health care systems in the fu-ture. The main risk factors for this phenomenon are age, inadequate social and family relationships, and can be as-sociated with mental problems such as depression and anxiety, somatic illnesses, often with additional dependencies. Imaging studies can detect abnormally functioning brain areas in the affected individuals, however, there is a signifi-cant heterogeneity among them. Similar to other addictions, extensive internet use negatively affects the individual in all areas of life. We do not have a high level of evidence for treatment yet, but it appears that treatments used in other (classic) addictive diseases may be effective.			

Declaration of the course:

Semester: both

Application deadline: 15th of September and 15th of February
Application: **email**: feher.gergely@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 7
number of seminars per week: 7

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: successful oral exam (>70%), participation in 75% of classes.

Opportunities for making up for non-attendance: based on individual consultation

List of resources (book, note, other) **required for learning the curriculum:**
Fariba KA, Gokarakonda SB. Impulse Control Disorders. 2023 Aug 14. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–.
Szapáry Á, Kovács M, Tóth G, Váradi I, Mészáros J, Kósa G, Kapus K, Bankó Z, Tibold A, Fehér G. Internetfüggőség: a 21. század orvosi kihívása? [Internet addiction: the medical challenge of the 21st century? br]. Orv Hetil. 2022 Sep 18;163(38):1506-1513

Topics and instructors of the activities (all lectures, practices, seminars separately):
1st week lecture: Formation, classification and psychological characteristics of addictions (Dr. Balázs Pankász)
Week 2 lecture: The neuroanatomy of addictions (Dr. József Farkas)
Week 3 lecture: Comparison of classic and digital addictions (Dr. Ildikó Radványi)
4th week lecture: Measurement of digital addictions (Dr. Gergely Fehér)
Week 5 lecture: Digital addictions and mental illnesses (Dr. Balázs Pankász)
Week 6 presentation: Digitalis addictions and somatic diseases (Dr. Gergely Fehér)
Week 7 lecture: Digital addictions: main research directions (Dr. Gergely Fehér)
8th week of practice: main aspects of conducting questionnaire tests (Dr. Lilla Horváth)
Week 9 exercise: online and paper-based questionnaires in research (Dr. Gergely Fehér)
10th week exercise: measurement possibilities of digital addictions (Dr. Gergely Fehér)
Week 11 exercise: treatment of digital addictions (Dr. Balázs Pankász)
Week 12 exercise: digital addictions and somatic diseases - the importance of screening tests (Dr. Gergely Fehér)
Week 13 exercise: data analysis options (Dr. Gergely Fehér)
Week 14 exercise: summary, discussions (Dr. Gergely Fehér)

code	instructor in charge	title	credit	host department
OPKI_B-1/2005_FEG4	**Dr. Fehér, Gergely**	Complex approach to burnout	2	Centre for Occupational Medicine
description	paradoxically affects medical personnel to the greatest extent. Due to its frequency, it is also called the epidemic of our time (along with diabetes). Overload/compulsion to perform (whether due to internal motivation or external factors - lack of labor), increased stress, work addiction and mania are the most important factors in the development of the syndrome, especially in cases where the work is directed at people for a long time ,			

	requires long-term concentration and emotional involvement, active intervention, while quick spectacular results and positive feedback are relatively rare (this group includes health workers, teachers, social workers, pastors, therapists, etc.) Although according to its classification, the burnout is considered an occupational disease, in addition to psychological/emotional exhaustion and reduced work capacity, there appears to be a significant correlation with diabetes and cardiovascular diseases, various pain syndromes, respiratory and gastrointestinal diseases, and the occurrence of death at a young age (<45 years), which is the basis of the classification of the disease requires reconsideration.

Declaration of the course:

Semester: both
Application deadline: 15th of September and 15th of February
Application: **email**: feher.gergely@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 7
number of seminars per week: 7

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: successful oral exam (>70%), participation in 75% of classes.

Opportunities for making up for non-attendance: based on individual consultation

List of resources (book, note, other) **required for learning the curriculum:**
Huecker MR, Shreffler J, McKeny PT, Davis D. Imposter Phenomenon. 2023 Jul 31. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–.
Office of the Surgeon General (OSG). Addressing Health Worker Burnout: The U.S. Surgeon General's Advisory on Building a Thriving Health Workforce [Internet]. Washington (DC): US Department of Health and Human Services; 2022–.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1st week lecture: The development, classification and psychological characteristics of burnout (Dr. Balázs Pankász)
Week 2 lecture: The neuroanatomy of burnout (Dr. József Farkas)
Week 3 presentation: Workplace, learning and parental burnout (Dr. Gergely Fehér)
4th week lecture: Measurement of burnout (Dr. Gergely Fehér)
Week 5 lecture: Burnout and mental illnesses (Dr. Balázs Pankász)
Week 6 lecture: Burnout and somatic diseases (Dr. Gergely Fehér)
Week 7 lecture: Burnout: main research directions (Dr. Gergely Fehér)
8th week of practice: main aspects of conducting questionnaire tests (Dr. Lilla Horváth)
Week 9 exercise: online and paper-based questionnaires in research (Dr. Gergely Fehér)
Week 10 exercise: options for measuring burnout (Dr. Gergely Fehér)
Week 11 exercise: burnout treatment (Dr. Balázs Pankász)
Week 12 exercise: burnout and somatic diseases - importance of screening tests (Dr. Gergely Fehér)
Week 13 exercise: data analysis options (Dr. Gergely Fehér)
Week 14 exercise: summary, discussions (Dr. Gergely Fehér)

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_GAA1	**Dr. Garami, András**	Theoretical and methodological aspects of complex energy balance (body mass and body temperature) regulation in animal models	2	Institute for Translational Medicine
description	By attending the course students will get detailed insight into the theoretical background and modern aspects of body mass and body temperature regulation, then based on the theoretical background they will see the various methods used to measure these processes in animal models.			

Declaration of the course:

Semester: both
Application deadline: by the end of the 3rd week of the given semester
Application: **name:** András Garami, M.D., Ph.D.
telephone: 536-246
email: andras.garami@aok.pte.hu

Maximum number of attending students: N/A
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week 1:
number of practices per week: 1

Type of examination: oral

Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: Students must attend at least 70% of the lectures/practices and pass the exam at the end of the course.

Opportunities for making up for non-attendance: Based upon individual agreements.

List of resources (book, note, other) **required for learning the curriculum:**
Vanilloid Receptor TRPV1 in Drug Discovery (A. Gomtsyan, C.R. Faltynek), Wiley & Sons, 2010.
www.FeverLab.net
Chapter 23. Temperature regulation. In: Lecture Notes on Human Physiology, 5th edition, ed. by Petersen O. Oxford, UK: Blackwell, 2007, p. 603-615.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1-2. History of the research of complex energy balance regulation.
3-4. Principles of the regulatory mechanisms in body mass and body temperature maintenance.
5-6. The modern theory of thermoregulation, the role of transient receptor potential (TRP) ion channels in temperature regulation.
7-8. The role of the capsaicin receptor (TRPV1) in thermoregulation and energy balance.
9-10. Methodological tools for the investigation of body mass regulation in animal models.
11-12. Methodological tools for the investigation of body temperature regulation in animal models.
13-14. Exam.

code	instructor in charge	title	credit	host department
OPEL_B-134/1993_GBA1	**Dr. Gaszner, Balázs**	Functional (neuro)morphology: theory and practice. How to use immunolabeling to obtain result with functional value?	2	Department of Anatomy
description	After discussion of the theory of immunohistological techniques, we offer the opportunity to practice these techniques in the laboratory. Fixation by perfusion, sectioning, simple and multiple (fluorescence) labeling will be performed, including digital documentation, image analysis, and statistical evaluation as well. The RNAscope in situ hybridization technique will be introduced also. The course, because of the laboratory work will be held in blocks. The preliminary plan is that the course takes place on three consecutive afternoons in four-five teaching hours, respectively. At the end of the course a test will be written, the time point of this will be discussed with the participants.			

Declaration of the course:

Semester: spring
Application deadline: 1st of March / 1st of October

Maximum number of attending students: 8 students / semester
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures: 4 lectures to be held in one block)
number of practices: (2x5 hours laboratory practice)

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.): Successful test result and attendance at (least) 70% of the classes.
Opportunities for making up for non-attendance: None.

List of resources (book, note, other) **required for learning the curriculum:** Lecture materials will be given as digital hand-outs for the participants.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures are given by Dr. Angéla Kecskés, Dr. Viktória Kormos (Pharmacology Dept. and Dr. Balázs Gaszner (Anatomy Dept.). Laboratory practices are given by Dr. Angéla Kecskés, Dr. Balázs Gaszner and Viktória Kormos with assistance of Izabella Orbán, and Danial Hegedüs technicians. (The confocal microscope will be presented by Dr. Gergely Berta (Dept. of Medical Biology)
1. Introduction. Routine histological technique (Lecture).
2. Theoretical background of immunolabeling. Visualization by enzymatic reactions. Combined fluorescent labeling Controls. (Lecture)
3. Theoretical background of RNAscope. (Lecture)
4. Theory of image analysis: cell counting, co-localization studies, densitometry (Lecture)
5. Preparation of required solutions, buffers.
6. Perfusion fixation on laboratory animals.
7. Tissue sampling. Post fixation. Basic neuroanatomy in rodents.
8. Cutting for free floating technique.

9. Permeabilisation, blocking, antiserum dilutions, preadsorption control
10. Biotin labeled secondary antibody treatment, fluorescent dye labeled secondary antibody treatment.
11. Peroxidase conjugated avidin-biotin complex treatment
12. Visualization of immunolabeling, mounting, covering.
13. Digital imaging with light microscope. Image analysis.
14. Digital imaging, and picture analysis. Fluorescence and confocal microscopy. (The confocal microscope will be presented by Dr. Gergely Berta (Dept. of Medical Biology)

code	instructor in charge	title	credit	host department
OPKL_B-2/2004_GAB1	**Dr. Gaszner, Balázs**	Non-invasive assessment of arterial function for the determination of cardiovascular risk	2	Heart Institute

description	The leading cause of death worldwide is the cardiovascular disease. Investigation of aortic stiffness has become increasingly important for total cardiovascular risk estimation. Several different methodologies have been proposed to the assessment of arterial stiffness. In our course we overview the different measurement techniques and compare them between high cardiovascular risk patient groups.

Declaration of the course:

Semester: fall
Application deadline: 30 of September
Application: **name:** dr. Gaszner, Balázs
telephone: *0633
email: gaszner.balazs@pte.hu

Maximum number of attending students: 10

Criteria of acceptance in case of overbooking: order of application, declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 2

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: successful exams, maximum number of absence: 4 hours
Opportunities for making up for non-attendance: consultation

List of resources (book, note, other) **required for learning the curriculum:** hand out

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Cardiovascular disease (Balázs Gaszner)
2. Pathophysiology, biomarkers (Balázs Gaszner)
3. Arterial stiffness parameters (Balázs Gaszner)
4. Ultrasound techniques (Balázs Gaszner)
5. Oscillometric techniques (Balázs Gaszner)
6. Prevention of cardiovascular disease (Balázs Gaszner)
7. Practical demonstration (Balázs Gaszner)

code	instructor in charge	title	credit	host department
OPKL_B-149/1993_GOK1	**Dr. Goolesorkhi, Kia**	Public Health Innovation Systems aiding the Economics of Behavioral Care	3	Department of Medical Public Health
description	The aim of this course is to introduce the advances in Public Health Innovation Systems and equip participants with analytical tools for assessing the organizational outcomes and the economic implications of adopting technology when addressing the behavioral aspects of healthcare service management. Participants will be able to deliver a current state assessment of a case incidence proposing alternative system level solutions. The module outcomes include topic related research methodologies for building transitional innovation systems. The participants systematically participate in researching, presenting their findings subject to a co-creative learning and discourse environment			

Declaration of the course:

Semester: both
Application deadline: Autumn September 15th, Spring February 15th
Application: **name:** Dr. Kia Goolesorkhi
telephone: +36209574021
email: kia.goolesorkhi@aok.pte.hu

Maximum number of attending students: 20
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 48 hours
number of lectures per week: 12
number of practices per week: 3
number of seminars per week:9

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).:
Opportunities for making up for non-attendance: Based on a separate consultation and agreement with the module leader

List of resources (book, note, other) **required for learning the curriculum:**

- Hung et. al. (2018) „Appreciative Inquiry: Bridging Research and Practice in a Hospital Setting", https://journals.sagepub.com/doi/full/10.1177/1609406918769444
- Garney et.al (2022) "Supporting and Enabling the Process of Innovation in Public Health: The Framework for Public Health Innovation" , 2022 Aug; 19(16): 10099. Published online 2022 Aug 16. doi: 10.3390/ijerph191610099
- Marsch L. et. al. (2014) Behavioral Care , Technology Theoretical Models to Inform Technology-Based Health Behavior Interventions (Chpt 2 Pages 13–24), Oxford University Press https://doi.org/10.1093/med/9780199314027.003.0002
- Sampat B (2019), „THE ECONOMICS OF HEALTH INNOVATION: LOOKING BACK AND LOOKING FORWARD", Columbia University, Chapter 2, WIPO publication series The Global Innovation Index 2019
- Luigi et.al (2024) in book „Experience in Healthcare Innovation Chpt 1: *User Knowledge, a Key Ingredient for Health Innovation and the Sustainability of our Health Systems*". https://doi.org/10.1002/9781394300723.ch1

- Luigi et. al (2024) in book „Experience Healthcare Innovation Reorienting Our Health System towards its Users Thanks to Design Thinking: The Experience of Kaiser Permanente" (Pages: 131-148)
- Luigi et. al (2024) in book „Experience Healthcare Innovation Patient-Centered Care at Public Hospitals : A War of the Worlds" **https://doi.org/10.1002/9781394300723.ch8**
- Hussain et. al. (2024) Exploring sustainable healthcare: Innovations in health economics, social policy, and management , RESEARCH ARTICLE| VOLUME 10, ISSUE 13, E33186, JULY 15, 2024 https://linkinghub.elsevier.com/retrieve/pii/S240584402409217X
- Iqbal M (2022) et. al "Diffusion of innovations: a guiding framework for public health Scand J Public Health 2022 Jul;50(5):533-537. doi: 10.1177/14034948211014104. Epub 2021 May 31"
- Borda et.al. (2024) Frontiers in Public Health Ed. „Living Labs and Open Innovation approaches" https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1378932/full
- Bergvall-Kåreborn (2010) „Participation in Living Lab: Designing Systems with Users" *Pries-Heje et al. (Eds.): IS Design Science Research, IFIP AICT 318, pp. 317–326, 2010. © IFIP International Federation for Information Processing 2010*

Topics and instructors of the activities (all lectures, practices, seminars separately):
Interactive Lectures : (Dr.Kia Goolesorkhi)
- A Brief History of Changes in the Medico-Social Sector over the Recent Decades: Diffusion of Innovation and the new landscape of Public Health
- Supporting and Enabling the Process of Innovation in Public Health: The Framework for Public Health Innovation
- Multi-, Inter-, and Transdisciplinarity within the Public Health : A Workforce capacity building perspective
- The Economics of Health Innovation and the moderating Role of the Public Health for improved Eco-Social and Socio-Economic Outcomes within the SDGs2030 Systems thinking paradigm
- Sustainable Healthcare Economics and The so-called Allied Care Partnership Challenges : Perspectives for Healthcare Systems
- Behavioral care and the Theoretical Models to Inform Technology-Based Health Behavior Interventions
- User Knowledge, a Key Ingredient for Health Innovation and the Sustainability of our Health Systems
- New Paradigm In Public Health Systems Design : Living Labs and Open Innovation approaches to scale impact for human wellbeing
- Co-Learning Facilitation with the Stakeholders and Users: A Sustainable Health Innovation Systems Capacity Building approach through Public Health Governance
- The Potential for Digital Health to Reframe the Role of Compassion in Patient Experience Innovation

Interactive Seminars and Practices : (Dr.Kia Goolesorkhi + The Participants in changing role plays)
- Innovations in Health Equity and Health Philanthropy: Integrated Healthcare from the Funders and Providers Perspective (Reflecting on the Faith Mitchell's 2016 article: the impact that social issues have on people's health. Grantmakers In Health (GIH) Stanford Social Innovation Review)- Seminar
- Appreciative Inquiry: Bridging Research and Practice in a Hospital Setting -Assimilated Classroom Practice
- The Professional, Team and Digital Identity: The Impact on Patient Experience: Reorienting Our Health System towards its Users Thanks to Design Thinking (a Kaiser case incidence). Seminar
- The Foundation of Digital Communities of Practice (CoP) in Healthcare through Appreciative inquiry: Individual and systems change with a focus on Wellbeing through digital engagement systems-Seminar
- Exploring sustainable healthcare: Innovations in health economics, social policy, and management through three contrastive case incidences- Seminar
- Patient-Centered Care at Public Hospitals: A War of the Worlds **https://doi.org/10.1002/9781394300723.ch8** (A role play practice)
- Participation in Living Lab A Swedish best practice : Designing Systems with Users for the Elderly - student led practice session based on provided material

The Experiential Approach and Alzheimer's Disease: Including the Spiritual Dimension for a More Global Approach -Seminar

- An Approach to Developing Peer Intervention within the context of a digitalized Living Lab (A Finnish best practice example)- Seminar

code	instructor in charge	title	credit	host department
OPKL_B-2/2004_HEL1	**Dr. Hejjel, László**	Biomedical measurement technology	2	Heart Institute
description	The application of measurement instrumentation is unavoidable today in medical diagnostics and biomedical research. The theory of operation of the devices will be discussed according to the physical nature of the measured value (voltage, pressure, flow, temperature, optical). Also the electronical background will be detailed both in hardware and software sides. Following the review of theory, on every occasion a practical presentation of the given instrument or a computer-simulation, or bed-side demonstration deepens the knowledge. The correct interpretation of the results provided by the devices or instruments, and the recognition of measurement errors and their parry can be easier after the acquirement of the approach of the course.			

Declaration of the course:

Semester: spring
Application deadline: end of the first week of given semester
Application: **name:** Dr. Hejjel, László
telephone: 35604, 35605
email: hejjel.laszlo@pte.hu

Maximum number of attending students: 12
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 7x2
number of lectures per week: 1
number of seminars per week: 1

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: max. absece: 2, examination on the last occasion
Opportunities for making up for non-attendance: oral referral

List of resources (book, note, other) **required for learning the curriculum:** presentations, issued e-material in pdf

Topics and instructors of the activities (all lectures, practices, seminars separately):
(one presentation and one seminar in the given topic at every occasion)

1. The definition, errors, and accuracy of measurement, interpretation of the results. Classification of measurement instrumentation
2. Acquiring and amplification of electrical signals: ECG, EEG, etc. Measuring impedance
3. Measuring pressure and flow. Acoustic measurements. Temperature measurement
4. Measurements based on optical methods
5. Digital signal processing: sampling, filtering, storage, analysis. Display devices
6. Power supply, electrical safety, electromagnetic compatibility. Wired and wireless data transmission
7. Summary. Examination

code	instructor in charge	title	credit	host department
OPKL_B-2/2004_HEL2	**Dr. Hejjel, László**	Technology and applications of heart rate variability analysis	2	Heart Institute

description	Heart rate variability (HRV) analysis is considered a non-invasive functional examination of the autonomic nervous system. The elevating number of the published materials in the topic reflects its significance not only in the research field but also in clinical practice: numerous cardiovascular and other diseases it is considered as an independent prognostic factor, it can predict the onset of certain events (arrhythmias, foetal hypoxia). HRV analysis necessitates special technical conditions and approach for correct interpretation of the results, which also will be reviewed on the course. Also the potential role of HRV analysis in "health monitoring" will be mentioned.

Declaration of the course:

Semester: autumn
Application deadline: end of the first week of given semester
Application: **name:** Dr. Hejjel, László
telephone: 35604, 35605
email: hejjel.laszlo@pte.hu

Maximum number of attending students: 12

Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 7x2
number of lectures per week: 1
number of seminars per week: 1

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: max. absece: 2, examination on the last occasion

Opportunities for making up for non-attendance: oral referral

List of resources (book, note, other) **required for learning the curriculum:** presentations, issued e-material in pdf

Topics and instructors of the activities (all lectures, practices, seminars separately):
(one presentation and one seminar in the given topic at every occasion)

1. History of heart rate variability (HRV) analysis. Anatomical, physiological background. Hardware background of measurement
2. HRV analysis in the time domain and frequency domain
3. HRV analysis with non-linear methods (chaos theory). Reliability and correct interpretation of HRV analysis
4. HRV analysis in the research
5. HRV analysis in the clinical practice. Novel parameters, novel potential applications
6. Home monitoring, telemonitoring. Wearable electronics, intelligent clothes, intelligent home
7. Summary. Examination

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_HEC1	**Dr. Hetényi, Csaba**	Introduction to modeling of biomolecules	4	Pharmacology and Pharmacotherapy
description	The course will introduce methods for structural calculation of biomolecules (proteins, peptides, nucleic acids and their ligands) important in drug design. Besides a theoretical background, applications of modeling softwares will be also demonstrated. Experimental molecular structure determination methods related to modeling will be also discussed. Finally, we will demonstrate the role of modeling techniques in the calculation of pharmacodynamics and pharmacokinetics.			

Declaration of the course:

Semester: autumn
Application deadline: the 3rd teaching day of the semester
Application: **name:** Dr. Hetényi, Csaba
telephone: 31649
email: hetenyi.csaba@aok.pte.hu

Maximum number of attending students: 3
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
number of lectures per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: oral exam
Opportunities for making up for non-attendance: in the last week of the semester

List of resources (book, note, other) **required for learning the curriculum:** presentations material

Topics and instructors of the activities (all lectures, practices, seminars separately):

1) Visualization of macromolecules. Programs VMD and PyMol. (Hetényi Csaba)
2) Structural editing and comparisons. (Hetényi Csaba)
3) An introduction to macromolecular structures. Main features of peptide and protein structures. (Hetényi Csaba)
4) Experimental sources of structural data of biopolymers (X-ray and NMR). Examples on structural variability. (Hetényi Csaba)
5) The role of conformational disorders of proteins in the pathomechanism of Alzheimer's and prion diseases. Myosin, the motor protein: same sequence with different structures. (Hetényi Csaba)
6) Simple methods for binding site detection and cavity search. Program PASS. (Hetényi Csaba)
7) Hierarchy of calculation methods. Programs for molecular modeling. (Hetényi Csaba)
8) Principles of molecular mechanics (MM). Force fields. Bonding and non-bonding interactions. The general algorithm of MM programs. Program packages. TINKER. (Hetényi Csaba)
9) Implicit and explicit solvation models. Hydrophobic interaction. (Hetényi Csaba)
10) Molecular dynamics (MD). Approximations and benefits of MD vs. experimental structure determination methods. MD program packages. GROMACS. Setting up an MD run. (Hetényi Csaba)
11) Sequence alignment and homology modeling: practice and limitations. A path from genomics to proteomics. Receptor modeling. Design of agonists and antagonists. (Hetényi Csaba)

12) Docking: a method for searching and engineering of molecular interactions of drug candidates. Program packages: GOLD, AutoDock. Rigid and flexible docking. Blind docking with AutoDock vs. cavity detection methods. (Hetényi Csaba)

13) Computational methods and strategies of drug design. (Hetényi Csaba)

14) Calculation of pharmacokinetic (ADMETox) parameters. Computational predictions and structural models of xenobiotics metabolism at CYP 3A4 of cytochrome P450 enzyme family. (Hetényi Csaba)

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_HEC2	**Dr. Hetényi, Csaba**	Strategies and methods of drug research	4	Pharmacology and Pharmacotherapy
tematika	The course gives and overview of current approaches of drug research. Both traditional and rational strategies will be discussed. An emphasis is placed on the drug research aspect of relevant experimental and theoretical methodologies. The course also provides practical knowledge on engineering of new drug candidates. In the Journal Club sections, up-to-date research results will be discussed using recent papers from the literature.			

Declaration of the course:

Semester: autumn
Application deadline: the 3rd teaching day of the semester
Application: **name:** Dr. Hetényi, Csaba
telephone: 31649
email: hetenyi.csaba@aok.pte.hu

Maximum number of attending students: 3
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
number of lectures per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: oral exam
Opportunities for making up for non-attendance: in the last week of the semester
List of resources (book, note, other) **required for learning the curriculum:** presentations material

Topics and instructors of the activities (all lectures, practices, seminars separately):
1) Goals, trends, and terminology of drug research (Hetényi Csaba)
2) Overview of strategies of drug design and discovery (Hetényi Csaba)
3) Traditional discovery 1 - HTS (Hetényi Csaba)
4) Traditional discovery 2 - Natural prodcucts as templates (Hetényi Csaba)
5) Rational design (Hetényi Csaba)
6) Target-based design 1 - Types of targets, non-protein targets (Hetényi Csaba)
7) Target-based design 2 - Target selection and validation, polypharmacology (Hetényi Csaba)
8) Target-based design 3 - Protein targets (Hetényi Csaba)
9) Ligand-based design, serendipity, and drug repositioning (Hetényi Csaba)
10) Structure determination methods (experimental and theoretical) (Hetényi Csaba)
11) Design of pharmacodynamics (experimental and theoretical methods) (Hetényi Csaba)
12) Design of pharmacokinetics (ADMETox optimization) (Hetényi Csaba)
13) Journal Club 1 - Comparison of strategies (Hetényi Csaba)
14) Journal Club 1 - Development of new methods and paradigm shifts (Hetényi Csaba)

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_KAZ1	**Dr. Karádi, Zoltán**	Central taste information processing: the role of taste in feeding control	2	Institute of Physiology

description	Primary taste qualities, peripheral signalling mechanisms. Neuronal coding, „labelled lines". Tastiness, palatability; taste aversion, taste preference. Gustation and smelling; modulation of adaptive behavior. Taste in health and disease. Involvement of the central glucose-monitoring neural network in taste information processing; neurochemical modulation. The role taste in the maintenance of homeostasis.

Declaration of the course:

Semester: fall & spring
Application deadline: the end of the 5th week of both semesters
Application: **name:** Prof. Dr. Karádi, Zoltán
telephone: 36243
email: zoltan.karadi@aok.pte.hu

Maximum number of attending students: 20
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 2

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: absences less than 30%; successful exam
Opportunities for making up for non-attendance: individually arranged personal reporting

List of resources (book, note, other) **required for learning the curriculum:**
Handbook of Olfaction and Gustation (R.L. Doty, Marcel Dekker Inc., 1995.);
Conditioned Taste Aversion (J. Bures, F. Bermudez-Rattoni, T. Yamamoto, Oxford Science Publ., 1998.)
Selected papers of scientific journals.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Taste buds, receptors, peripheral mechanisms. Central taste pathways, gustatory neurons „labelled lines". Taste preference and taste aversion, ethological and clinical aspects. Tastiness, palatability. Smelling and tasting; flavor, adaptive ingestive behavior. Central taste information processing – central glucose-monitoring neurons. Neurochemical modulation. Human tasting, cultural and pathological aspects.
Course leader, lecturer: Prof. Dr. Zoltán Karádi

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_KAZ2	**Dr. Karádi, Zoltán**	Central regulation of homeostasis: feeding and metabolism	2	Institute of Physiology

description	Constant condition of the internal environment; the homeostasis theory. Food- and fluid intake; regulation of body weight; metabolic control. Functioning of the central glucose-

	monitoring neural network. Neuroimmunological modulation, primary cytokine effects. Animal model of diabetes mellitus; the metabolic syndrome.

Declaration of the course:

Semester: fall & spring
Application deadline: the end of the 5th week of both semesters
Application: **name:** Prof. Dr. Karádi, Zoltán
telephone: 36243
email: zoltan.karadi@aok.pte.hu

Maximum number of attending students: 20

Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course
Time frame of education total hours of the course: 14
number of lectures per week: 2

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: absences less than 30%; successful exam
Opportunities for making up for non-attendance: individually arranged personal reporting

List of resources (book, note, other) **required for learning the curriculum:**
Textbook of Medical Physiology (Guyton & Hall), Elsevier Saunders, 2011.
Handbook of Diabetes (G. Williams, J.C. Pickup, Blackwell Science, 1999.)
Selected papers of scientific journals.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Constant state of the internal environment, homeostasis. Neural and humoral processes of the central regulation of food and fluid intake. The central glucose-monitoring (GM) neuronal network. Role of neuropeptides. Neuroimmunological modulation. Interleukin 1beta. Pathological alterations of feeding, body weight control, and metabolism. Diabetes mellitus, metabolic syndrome: shifts in the balance of the central GM network? Clinical consequences.
Course leader, lecturer: Prof. Dr. Zoltán Karádi

code	instructor in charge	title	credit	host department
OPKI-B-1/2014_KAB1	**Dr. Kálmán, Bernadette**	Genetics and genomics in neurology	2	Institute of Laboratory Medicine
description	This course will review basic concepts of genetics and genomics with focus on new diagnostic and therapeutic approaches in neurology. Mendelian, mitochondrial and complex trait disorders will be discussed. Briefly, somatic mutations in tumors and personalized treatment options will also be reviewed.			

Declaration of the course:

Semester: spring, February 1 and February 2,
Application deadline: January 31,
Application: **name:** Prof. Dr. Kálmán, Bernadette
telephone: 72-501-500/29205
email: Bernadette.kalman@pte.hu
Location of the Course: PTE Szenagothai Research Center, 7624. Pecs, Ifjusag street 20.

Maximum number of attending students: 30
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14h
number of lectures per week: 14h (lectures completed in 2 consecutive days)

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).:
exam and min. 9 attended lectures
Opportunities for making up for non-attendance: review of the lecture powerpoint slides and the recommended book

List of resources (book, note, other) **required for learning the curriculum:**
Lecture material (powerpoint, pdf)
Tom Strachan, Andrew P Read: Human Molecular Genetics. Taylor and Francis Group 2018. 5th Edition.

Topics and instructors of the activities (all lectures, practices, seminars separately):
February 1,
8-8:45 Basic principles of nucleic acids, genome, genes -BK
8:45-9:30 Gene expression and regulation - BK
9:30-10:15 Patterns of inheritance - BK
Break
10:30 - 11:15 Mitochondrial genetics and diseases – BK
11:15-12 Complex trait genetics and diseases - BK
12-12:45 Alzheimer's disease - BK
Break
13:30-14:15 Amyloid neuropathies - BK
14:15-15 Frontotemporal dementias and prion diseases - BK
February 2,
8-8:45 Huntigton's disease - BK
8:45-9:30 Cerebellar ataxias_AR - BK
9:30-10:15 Cerebellar ataxias_AD - BK
10:15-11 Neurodegeneration with brain iron accumulation - BK
Break
11:15-12 Spinal muscular atrophy - BK
12-12:45 Tumor biology, genetics and personalized medicine - BK
Break
13:30-14:15 Written exam

code	instructor in charge	title	credit	host department
OPMU_B-130/1993_KEA1	**Dr. Kengyel, András**	Rapid Kinetic Methods in Biology	2	Department of Biophysics
description	The majority of biological processes are governed by structural and kinetic properties. Therefore, a comprehensive understanding of these latter aspects is of critical importance for the proper description of biological systems. The objective of this course is to provide knowledge and experience in the principles and basic applications of rapid kinetic methods, which are suitable for following biochemical processes on the millisecond timescale. In the second part of the course, the PhD students learn practical applications involving the design of rapid kinetic experiments, performing measurements and analyzing the data.			

Declaration of the course:

Semester:		spring
Application deadline:		28. February
Application:	**name:**	Dr. Kengyel, András Miklós
	telephone:	31651
	email:	andras.kengyel@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 2
number of practices per week: 2
Remark: The lectures and practices will be held in a cluster over two consecutive days.

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absences, etc.).: Maximal absence of 3 hours, completing the written exam.
Opportunities for making up for non-attendance: Should be discussed with the lecturer.

List of resources (book, note, other) **required for learning the curriculum:**
Pilling, M.J., Seakins P.W.: Reaction Kinetics (Oxford University Press, 1995)
Keszei, E. Reaction Kinetics: An Introduction. (Springer, 2021). doi.org/10.1007/978-3-030-68574-4
Gutfreund, H.: Kinetics for the Life Sciences, Cambridge University Press, ISBN 052148586X.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:
1. Mathematical basics (Dr. Bukovics Péter)
2. The principles of enzyme kinetics (Dr. Bukovics Péter)
3. Theoretical bases of spectroscopic methods (Dr. Ujfalusi Zoltán)
4. Mixing-based and relaxation methods (Dr. Kengyel András)
5. The setup and function of the stopped flow instrument (Dr. Ujfalusi Zoltán)
6. The application of stopped flow methods on model systems (Dr. Kengyel András)
7. Femto-biological methods (Dr. Lukács András)
8. Mathematical analysis of results (Dr. Ujfalusi Zoltán)
Practices
1. Basic stopped-flow experiments, dead time (Dr. Kengyel András)
2. Characterizing contractile proteins using rapid kinetic techniques (Dr. Ujfalusi Zoltán)
3. Measurements using transient absorption systems (Dr. Lukács András)

code	instructor in charge	title	credit	host department
OPKL_B-2/2004_KOA1	**Dr. Kónyi, Attila**	Cardiac implantable electronic devices: surgical technique, follow-up, programming	2	Heart Institute
description	During this course, candidates will gain insight into the surgical technique of implantable cardiology electronic devices (CIEDs), postoperative programming, and the issues of outpatient and telemetry follow-up. Course explores the latest innovations in device technology and their impact on patient outcomes, particularly in managing			

	arrhythmias and heart failure. The issue also addresses the challenges in device implantation, optimization of therapy, and strategies to minimize complications. Case studies and expert reviews provide insights into best practices and future directions in cardiac device therapy.

Declaration of the course:

Semester: both
Application deadline: 03/SEP; 31/JAn
Application: **name:** dr. Kónyi, Attila
telephone:+36302263058
email: konyi.attila@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 1x1
number of practices per week:1x1

Type of examination: **written**
Type of remedial exam: **written**

Criteria of accepting the course (exams, maximum number of absence, etc.).:
minimum 70% attendance, successful written exam
Opportunities for making up for non-attendance: 1 time, at a pre-arranged time

List of resources (book, note, other) **required for learning the curriculum:**
- Clinical Cardiac Pacing, Defibrillation and Resynchronization Therapy, Ellenbogen, Kenneth, A. et al. Available from: Elsevier eBooks+, (5th Edition). Elsevier - OHCE
-Pacemaker, ICD and CRT Troubleshooting, EHRA, volume 1, 2 - Haran Burri

Topics and instructors of the activities (all lectures, practices, seminars separately):

1. **Lecture:** Historical Overview, Structure of CIEDs, Technical Fundamentals of Surgery
   Practice: Techniques for Implantation of Transvenous Pacemakers, Ultrasound-Guided Puncture Techniques - **Dr. Attila Kónyi**
2. **Lecture:** Indications, Complications and Their Management
   Practice: Fixation Techniques, Practice of Electrode Fixation - **Dr. Lőrinc Holczer**
3. **Lecture:** Defibrillator Therapy, Indications, Basics of ICD Operation, Therapeutic Options
   Practice: ICD Programming, Introduction to Programmers from Different Manufacturers, Case Studies, Subcutaneous and Substernal ICDs - **Dr. Szandra Grátz**
4. **Lecture:** Resynchronization Therapy, Theoretical Basics, Indications, Remote Monitoring
   Practice: Case Studies, Troubleshooting, Remote Monitoring Data Analysis - **Dr. Péter Ezer**
5. **Lecture:** Leadless Pacemaker Therapy, The Role of AI in the Future of Pacemaker Therapy
   Practice: Echo-Guided Vein Puncture, Sheath Insertion Techniques - **Dr. Attila Kónyi**
6. **Lecture:** Conduction System Pacing, LOT and HOT CRT
   Practice: ECG Analysis, Case Studies of LBB Area Pacing and His Pacing - **Dr. Péter Ezer**
7. **Exam:** Test

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_LEL2	**Dr. Lénárd, László**	Hunger, satiety and body weight regulation	4	Department of Physiology
description	The incidence of feeding related disorders (obesity, bulimia and anorexia) and appearance of related secondary diseases (arteriosclerosis, diabetes mellitus and stroke)			

	have increased dramatically world-wide. The goal of the course is to review physiological and pathological mechanisms of central regulatory processes of feeding and body weight. The role of newly discovered orexigenic and anorexigenic neuropeptides and dopaminergic mechanisms in food related rewarding-reinforcing processes will be discussed. Mechanisms and consequences of feeding related diseases (obesity, bulimia and anorexia nervosa) will be reviewed.

Declaration of the course:

Semester: fall & spring
Application deadline: 20, September, 30, January

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 4

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: final exam, max. number of absence: 3 h
Opportunities for making up for non-attendance: consultation

List of resources (book, note, other) **required for learning the curriculum:** will be discussed and distributed in the course

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures: The role of hypothalamic and limbic structures in hunger and body weight regulation. Monitoring the internal environment. The role of humoral and afferent neural signals in the regulation of hunger and satiety. Glucose-monitoring neurons in the periphery and in the central nervous system. Orexigenic and anroexigenic neuropeptides. The role of monoaminergic systems in the regulation of feeding. Short-term and long-term regulation of body weight. The rewarding value of foods. Obesity, bulimia and anorexia nervosa. Bulimia and drug-addiction behavior.

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_LEL4	**Dr. Lénárd, László**	The role of monoaminergic systems and neurotransmitters in learning-reinforcing mechanisms and addictive behavior.	3	Department of Physiology
description	The chemical self-stimulation paradigm is the animal model of human addictive behavior. During rewarding learning processes and after intracerebral amphetamine microinjections dopamine is released. The rewarding-reinforcing effects of endogenous opioids and cannabinoids have also been verified. It has been shown that other neuropeptides (such as substance P, neurotensin and oxytocin) can also play essential roles in the rewarding-reinforcing processes. In the course the role of CNS monoaminergig systems, different neuropeptides and their interaction with dopamine will be detailed and discussed and relationship between learning and addictive behavior will be analyzed.			

Declaration of the course:

Semester: fall
Application deadline: 20, September

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 12
number of lectures per week: 4

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: final exam, max. number of absence: 3 h
Opportunities for making up for non-attendance: consultation

List of resources (book, note, other) **required for learning the curriculum:** will be discussed and distributed in the course

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures: Brain dopaminergic, noradrenergic and serotoninergic systems. The role of amygdala, nucleus accumbens, prefrontal cortex and cingular cortex in learning and addiction. Dopamine release during learning and addiction. Neuropeptides, learning and reinforcement. Receptors and signal transduction processes. Monoaminergic – peptidergic interactions. Amphetamine, cocaine and morphine addiction.

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_LEL5	**Dr. Lénárd, László**	Neurobiological and behavioral research methods utilized in animal experiments	6	Department of Physiology
description	The main goal of the course is to detail methodological approaches from planning to completion of animal experiments. Examples will be given concerning the criteria of the experimental plan. Different behavioral paradigms will be detailed to study learning and memory processes. Data analysis and the appropriate statistical evaluation methods will be discussed. Advices will be given about interpretation of data and technology to complete research materials for publication.			

Declaration of the course:

Semester: fall
Application deadline: 20, September

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 4

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: final exam, max. number of absence: 3 h
Opportunities for making up for non-attendance: consultation

List of resources (book, note, other) **required for learning the curriculum:** will be discussed and distributed in the course

Topics and instructors of the activities (all lectures, practices, seminars separately):
Making an experimental plan.The experimental design. Anaesthesia and stereotaxic brain operation. Metal and glass electrodes and pipettes. Direct brain microinjections. Neurotoxic leasions. Electric brain stimulation and recording methods. Behavioral paradigms (active and passive avoidance, labyrinth learning, place preference, elevated plus maze). Conventional histological methods to verify electrode and cannula placements. Data analysis: parametric and non-parametric statistical methods. Interpretation of data. How to write and publish a paper.

code	instructor in charge	title	credit	host department
OPKL_B-149/1993_LOS1	**Dr. Lohner, Szimonetta**	Introduction to systematic review and meta-analysis	4	Department of Public Health Medicine
description	A systematic review is a means of identifying, evaluating and interpreting all available research relevant to a particular research question. In contrast to the traditional or narrative literature reviews, systematic literature reviews are using a rigorous and well-defined approach for summarizing available scientific literature. As part of a systematic review data are often quantitatively summarized in a meta-analysis. Systematic reviews are important for both the medical practice and medical research, as they facilitate the formulation of timely professional recommendations and help to make the decision whether further trials on a specific clinical question are necessary. During the course, interactive lectures will enable participants to gain the knowledge and skills necessary for the effective planning of a systematic review, for carrying out structured literature searches, for extracting data effectively from publications, for assessing risk of bias, for performing a meta-analysis, and for assessing the certainty of available evidence.			

Declaration of the course:

Semester: spring
Application: **name:** Dr. Lohner, Szimonetta
telephone: +36 30 250 1463
email: lohner.szimonetta@pte.hu

Maximum number of attending students: 15
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 28 (21 lectures, 7 practices)

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).:
Maximum of 15 % absence allowed

Opportunities for making up for non-attendance:
Missing not more than 4 hours may be amended by studying at home and answering specific questions of the tutor.

List of resources (book, note, other) **required for learning the curriculum:**
Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). *Cochrane Handbook for Systematic Reviews of Interventions* version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.
Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). *Cochrane Handbook for Systematic Reviews of Interventions*. 2nd Edition. Chichester (UK): John Wiley & Sons, 2019.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:
1. Role of scientific literature in the daily health care practice
2. Effective literature searching for a focused question
3. Definition and importance of systematic reviews.
4. How to read a systematic review? How to interpret a forest plot?
5. Writing a systematic review following Cochrane methods
6. Defining a review question using PICOS
7. Searching for studies: Developing a search strategy.
8. The MEDLINE database. The Cochrane Library
9. Systematic literature searching in other databases. Searching clinical trial registers (clinicaltrials.gov, EU Clinical Trials Register, WHO ICTRP). Searching for grey literature
10. Selecting studies. The PRISMA flow-chart
11. Using software supporting systematic literature searching and screening
12. Collecting data from included studies for systematic reviews of interventions
13. Analysing dichotomous outcomes
14. Analysing continuous outcomes
15. Analysing other outcomes and study designs
16. Introduction to meta-analysis with RevMan. Useful features in RevMan
17. Heterogeneity
18. What is risk of bias?
19. Reporting biases. Funnel plots
20. Assessing the certainty of evidence (GRADE)
21. Evidence as part of medical decision-making. Systematic reviews in clinical trial planning
Practices:
1. Systematic literature searching in MEDLINE (via Pubmed and via Ovid Medline)
2. Data collecting exercise
3. Introduction to meta-analysis with RevMan – part I (Setting up a new review, analysing dichotomous outcomes)
4. Introduction to meta-analysis with RevMan – part II (Analysing continuous outcomes)
5. Assessing risk of bias with Cochrane RoB 2.0 tool – part I
6. Assessing risk of bias with Cochrane RoB 2.0 tool – part II
7. GRADE exercise

code	instructor in charge	title	credit	host department
OPMU_B-130/1993_LUA3	**Dr. Lukács, András**	Functional Protein Dynamics: the Application of Luminescence Spectroscopic Methods	4	Department of Biophysics
description	The function of proteins and other macromolecules is governed by their function and interactions. These functions are manifested in close coupling with their actual conformational state and dynamic properties. A powerful arsenal of			

	methods to characterise these properties is offered by luminescence spectroscopy. The course aims to provide the basic principles of these methods and will also give insights into the advantages and limitations of their applications.

Declaration of the course:

Semester: spring
Application: **name:** dr- Lukács, András
telephone: 536267
email: andras.lukacs@aok.pte.hu

Maximum number of attending students: 12
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 1
number of practices per week: 3

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: successful exam and no more than 3 absences

List of resources (book, note, other) **required for learning the curriculum:** chapters of the Medical Biophysics book is advised

Topics and instructors of the activities (all lectures, practices, seminars separately):
Lectures:
Reaction kinetics, enzyme kinetics;
Luminescence spectroscopy;
Practicals:
Fluorescence spectroscopy;
Fluorescence Resonance Energy Transfer;
Fluorescence quenching;
Polarisation, anisotropy;

code	**instructor in charge**	title	credit	host department
OPKL_B-149/1993_MAE1	**Dr. Marek, Erika**	Medical and healthcare aspects of international migration	4	Department of Operational Medicine

tematika	During this multidisciplinary course students will learn of the medical and healthcare aspects and consequences of the increased migration (especially irregular migration) towards Europe from various aspects. Participants will gain in knowledge regarding the specific health needs of the newcomers arriving from distant geographic areas and also of the specific aspects of their healthcare assistance: legislation and their access to care, medical screening examinations and their results from the previous years, occupational health aspects and methods of age-assessment. Students will also learn of the fundamentals of migrant-sensitive health-care systems and intercultural aspects of care, as well as the psychosocial and mental health needs of victims of trafficking.

Declaration of the course:

Semester: spring
Application deadline: 15th February

Application: **name:** dr. Marek, Erika
telephone: 35335
email: erika.marek@aok.pte.hu

Maximum number of attending students: 15 students
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 48
number of lectures per week: 24

Type of examination: written (essay on a previoulsy discussed topic)
Type of remedial exam: written (essay on a previoulsy discussed topic)

Criteria of accepting the course (exams, maximum number of absence, etc.).: Maximum of 15 % absence allowed
Opportunities for making up for non-attendance: Based on independent consultation with course leader

List of resources (book, note, other) **required for learning the curriculum:**

- A. Rundle, M. Carvalho, M. Robinson. Cultural Competence in Health Care: A Practical Guide 2nd Edition, ISBN: 978-0-7879-6221-0
- M. B. Schenker (Ed.), X. Castaneda (Ed.), A. Rodriguez-Lainz (Ed.) Migration and Health: A Research Methods Handbook Paperback -2014 Publisher: University of California Press; 1 ed. ISBN-10: 0520277953
- Felicity Thomad (Ed.). Handbook of Migration and Health. E.Elgar, 2016, ISBN: 9781784714772

14. Topics and instructors of the activities (all lectures, practices, seminars separately):

Introduction. Migration as global phenomenon: history, terms, recent trends of regular and irregular migration. dr. Erika Marek
Principals of migration-health in reflection to current WHO and ECDC recommendations. dr. István Szilárd
Main countries/regions of origin for migrants 1. The Middle-East: Syria, push-factors, routes, public health and intercultural aspects. dr. Erika Marek
Main countries/regions of origin for migrants 2. Afghanistan: push-factors, routes, public health and intercultural aspects (+ Africa, climate migration). dr. Erika Marek
Migration-health as a new, interdisciplinary field of research: overview of the health and public health aspects of migration stages (countries of origin, transit and destination countries) dr. Erika Marek
Health assessment of migrants in Hungary: results from the refugee reception centres (2007-2015, Debrecen) in reflection to general national epidemiological indicators and ECDC screening recommendations. dr. Erika Marek
National legislation of healthcare for migrants. Differing legal regulations and entitlements to healthcare for migrants in the EU. dr. Zoltán Katz
Migration-related health challenges: a critical assessment of the “healthy migrant-effect” through international examples. dr. Zoltán Katz
Vaccine-preventable diseases (VPDs) and their relation to migration, significance of vaccinations in the global health security program. dr. Zoltán Katz
Occupational-health aspects of migration I-II. Healthy-migrant workforce and occupational-health of the care providers (border-police staff, administrative staff, healthcare workers, etc.). dr. Erika Marek
Age-assessment. dr. Antal Kricskovics

Violence and migration: sexual and gender-based violence in the refugee cycle. Violent cultural practices (female genital mutilation, FGM). dr. Erika Marek
Psycho-social aspects of migration and principals of providing care for victims of trafficking and torture. dr. Lilla Hárdi/Cordelia Foundation
Migrant-sensitive primary care and secondary care. Introduction of Amsterdam Declaration and the Migrant-friendly Hospitals Program. dr. István Szilárd
Migrants' barriers in accessing healthcare and some 'Best Practices' in overcoming barriers and providing migrant-sensitive healthcare. dr. Erika Marek
Intercultural competence in healthcare: understanding culture and the role of culture in health. dr. Erika Marek
Prejudice and discrimination towards migrant and other minority populations in healthcare: their effects on patients' health and access to healthcare and 'how to overcome? (tips)' dr. Erika Marek
Overcoming linguistic and cultural barriers: cultural mediation and 'how to work together with medical interpreter?' dr. Erika Marek
Religious aspects in health and care: practical points for healthcare providers (some selected examples) dr. Erika Marek
Health promotion and health education in migrant communities. dr. Erika Marek
Consolidation, final assessment. dr. Erika Marek

code	instructor in charge	title	credit	host department
OPKL_A-442/2000_MAS2	**Dr. Márton, Sándor**	The dangers of morbid obesity	2	Department of Anaesthesiology and Intensive Therapy
description	Morbid obesity is one of the most common diseases of our time and is now recognised by the WHO as a disease in its own right. Along with known comorbidities such as hypertension, cardiac decompensation, restrictive lung disease, arthritic disease, it is also often associated with chronic immune disease. It is the most common pathological condition in pregnancy, affecting both the expectant mother and the newborn. Bariatric surgery is increasingly used to treat it above a certain BMI. The aim of this course is to review the pathophysiology and complex management of morbid obesity.			

Declaration of the course:

Semester: both
Application: **name:** dr. Márton, Sándor
telephone:+36309369559
email: marton.sandor. pte.hu

Maximum number of attending students:14
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course
Time frame of education total hours of the course:14
number of lectures per week:1

Type of examination: oral
Type of remedial exam: oral

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Dr. Kriszta Tóth Márton Pathology of morbid obesity
2. Dr. Kriszta Tóth Co-morbidities of morbid obesity
3. Dr. Sándor Lénárd Chronic inflammation of chordomas
4. Dr. Sándor Márton Treatment options for morbid obesity

code	instructor in charge	title	credit	host department
OPKL_A-319/1995_MGA1	**Dr. Molnár, Gergő Attila**	Systemic diseases and renal affection: renocardiac, cardiorenal, pulmorenal and other syndromes	1	2nd Department of Internal Medicine and Nephrological-Diabetes Centre

description	The course would like to cover beyond the diseases affecting the kidneys and the heart or the kidneys and the lungs (renocardial, cardiorenal and pulmorenal syndromes) also other systemic diseases that affect the kidneys. Nephrology is a subdiscipline of internal medicine with many interfaces towards other fields. These interfaces include diseases that also involve other organs beyond the renal affection. Among others, we would like to cover the five major classic types of cardiorenal/renocardial syndromes, as well as other models describing the interaction of kidney and the heart. we would cover the pulmorenal syndromes as well as renal involvement in systemic autoimmune diseases and other systemic diseases.

Declaration of the course:

Semester: autumn
Application deadline: September 6,
Application: **name:** Dr. Molnár, Gergő Attila
telephone: +36309757818
email: molnar.gergo@pte.hu

Maximum number of attending students: 6
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course
Time frame of education total hours of the course: 7
number of seminars per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: oral exam, maximum allowed absence: 30% (2 occasions)
Opportunities for making up for non-attendance: none

List of resources (book, note, other) **required for learning the curriculum:**
Notes taken individually during the seminars
Nephrology and hypertension lecture notes for medical students (Second Department of Medicine and Nephrology-Diabetes Centre, University of Pécs, Medical School/Clinical Centre)
Comprehensive Clinical Nephrology, 6th Edition, Elsevier, 2019
Brenner and Rector's The Kidney, 11th Edition, Elsevier, 2019

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Renal involvement in systemic diseases (Dr. Gergő A. Molnár)
2. Cardiorenal syndromes (CRS 1-2) (Dr. Gergő A. Molnár)
3. Renocardial syndromes (CRS 3-4) (Dr. Gergő A. Molnár)
4. Other types of cardiorenal syndrome (CRS5) and potential bidirectional connections (Dr. Gergő A. Molnár)
5. Pulmorenal syndromes, clinical decision-making (Dr. Gergő A. Molnár)
6. Renal involvement in systemic immune diseases (Dr. Gergő A. Molnár)
7. Renal involvement in other systemic diseases and as part of a multi-organ failure syndrome (Dr. Gergő A. Molnár)

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_PIE1	**Dr. Pintér, Erika**	Drug and substance abuse	2	Pharmacology and Pharmacotherapy

description	During the course we will discuss about the nature of the drug and substance abuse and dependence. We will characterize the most important groups of substances with high or moderate abuse potential. The main pharmacological groups are: opioids, CNS depressants, psychomotor stimulants and psychedelic agents.

Declaration of the course:

Semester: spring
Application deadline: 15 February
Application: **name:** Dr. Pintér, Erika
telephone: 72-536217/35097
email: erika.pinter@aok.pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 2

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: exams, maximum number of absence
Opportunities for making up for non-attendance: none

List of resources (book, note, other) **required for learning the curriculum:** PPT presentation on the Coospace

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. General terms,
2. Opioids, CNS depressants I.
3. CNS depressants II. (ethanol)
4. Psychomotor stimulants
5. Psychedelics
6. Practical aspects of the drug abuse (Dr. János Szemelyácz)
7. PPT presentations of the students, written exam

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_POJ1	**Dr. Pongrácz, Judit**	Applied pharmaceutical biotechnology	2	Department of Pharmaceutical Biotechnology

description	Pharmaceutical biotechnology is not restricted to basic research: applied pharmaceutical biotechnology already delivers state-of-the-art treatment options. The aim of the course is to provide an overview on the significance and potential of applied pharmaceutical biotechnology through specific, relevant examples. These include current treatment options for cancer treatment (VEGF signaling, MDR variants) and also test systems for modeling alterations in drug-metabolism activity (changes in CYP450 activity due to ethnicity or age). The course provides synthesis of interdisciplinary pharmaceutical biotechnology knowledge, to obtain skill-level overview.

Declaration of the course:

Semester: autumn
Application deadline: 10th September 2023
Application: **name:** dr. Kvell, Krisztián
telephone: ext. 35551
email: kvell.krisztian@pte.hu

Maximum number of attending students: 15
Criteria of acceptance if overbooked: order of application

Time frame of education total hours of the course: 14
number of seminars per week: 1

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: according to general applicable rules of the University of Pecs
Opportunities for making up for non-attendance: according to personal negotiation

List of resources (book, note, other) **required for learning the curriculum:**
Recommended literature: Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications (2012) by Oliver Kayser and Heribert Warzecha

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Introduction to pharmaceutical biotechnology (methodology, applications, significance)
lecturer: Prof. Judit Pongracz DSc and Krisztian Kvell MD PhD (2x45min. seminar)
2. Applied pharmaceutical biotechnology – module I.: evaluation of drug-metabolism kinetics in human model cell line (in vitro assessment of CYP450 variants)
lecturer: Krisztian Kvell MD PhD (3x45 min. seminar)
3. Applied pharmaceutical biotechnology – module II.: evaluation of drug-transporter activity in human model cell line (in vitro assessment of MDR variants)
lecturer: Luca Jaromi PhD (3x45 min. seminar)
4. Applied pharmaceutical biotechnology – module III.: evaluation of micro-vasculature in human model cell line (in vitro manipulation of VEGF signaling)
lecturer: Gyorgy Miskei PhD (3x45 min. seminar)
5. Synthesis of pharmaceutical biotechnology modules: evaluation of all previous module data**,** consultation, final exam
lecturer: Krisztian Kvell MD PhD (3x45 min. seminar)

kurzuskód	felelős oktató	elnevezés	kredit	oktató intézet
OPKL_B-1/2008_POE2	**Dr. Pozsgai, Éva**	Scientific novelties and practical aspects of cancer screening and diagnostics	2	Institute of Primary Health Care, Department of Public Health
tematika	The aim of the course is to review the scientific novelties in cancer screening and diagnostics from a practical perspective. We describe the results of our research projects involving clinicians and general physicians working with cancer patients. The lectures will focus on the role of tumormarkers in the most common cancer diseases, as well as the relevance of the elapsed time between the appearance of the first symptoms until diagnosis in colorectal cancer patients.			

Declaration of the course:

Semester: spring
Application: **name:** dr. Pozsgai, Éva
telephone: 30/6248-176
email: pozsgay83@gmail.com

Maximum number of attending students: 15
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week:2

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: successful oral report, participation in 70% of the lectures
Opportunities for making up for non-attendance: personal consultation

List of resources (book, note, other) **required for learning the curriculum:** ppt from the lectures, recommended articles

Topics and instructors of the activities (all lectures, practices, seminars separately):
1-2: Cancer screening programs and cancer diagnostics in practice.
3-4: The role of tumormakers in the diagnosis of cancer. 1. Methodology, suitable markers in research
5-6: The role of tumormakers in the diagnosis of cancer. 2. Our research group's findings in the light of international data. Potential clinical applications.
7-8: Screening guidelines for colorectal cancer. A review of international guidelines.
9-10: The elapsed time to diagnosis in colorectal cancer patients from the general physicians' perspective. The results of a pilot study in Baranya county (I.)
11-12: Primary symptoms and the time to treatment in colorectal cancer patients. The results of a pilot study in Baranya county (II.)
13-14: The role of HPV in the development of cancer. The prognostic role of HPV in cancer. Cervical cancer screening. HPV in head and neck cancer.
12-13: The role of patient education in cancer screening. Communication with cancer patients.
Instructors: dr. Éva Pozsgai, dr. Szabolcs Bellyei, dr. András Papp

kurzuskód	felelős oktató	elnevezés	kredit	oktató intézet
OPGY_A-144/1994_POG1	**Dr. Pozsgai Gábor**	A szulfid biológiai hatásainak vizsgálati lehetőségei	2	Department of Pharmacology, and Pharmacotherapy
tematika	Intensity of the research on the biological effects of sulfide and on its medical utilization has been rising for decades. The course demonstrates biological effects of sulfide forms examined by our research group. Participants can obtain crucial practical skills in sulfide research.			

Declaration of the course:

Semester: spring
Application deadline: Friday of the 2nd week of the respective semester until 16:00.
Application: **name: Dr. Gábor Pozsgai**
telephone: +36309224407
email: pozsgai.gabor@pte.hu

Maximum number of attending students: 15

Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 28
number of lectures per week: 14
number of practices per week: 14

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).:
Maximal absence is 25% of the classes.
Opportunities for making up for non-attendance: Not possible.

List of resources (book, note, other) **required for learning the curriculum:**
Ikeda et al. Anal Chim Acta. 2017 May 29:969:18-25. doi: 10.1016/j.aca.2017.03.027.
Pozsgai et al. Nitric Oxide. 2017 May 1;65:10-21. doi: 10.1016/j.niox.2017.01.012.
Bátai et al. Front Endocrinol (Lausanne). 2018 Feb 27;9:55. doi: 10.3389/fendo.2018.00055.
Bátai et al. Front Pharmacol. 2019 Sep 4;10:964. doi: 10.3389/fphar.2019.00964.
Dombi et al. Int J Mol Sci. 2021 Mar 25;22(7):3363. doi: 10.3390/ijms22073363.
Bátai et al. Pharmaceuticals (Basel). 2022 May 27;15(6):671. doi: 10.3390/ph15060671.
Göntér et al. Int J Mol Sci. 2024 Jul 13;25(14):7701. doi: 10.3390/ijms25147701.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Lecture: Role of sulfide in evolution, cells and organisms (Kitti Göntér)
2. Lecture: Forms of sulfide in the body and its interaction with proteins (Dr. Gábor Pozsgai)
3. Lecture: Detection of sulfide-protein interactions I (Dr. Gábor Pozsgai)
4. Lecture: Detection of sulfide-protein interactions II (Dr. Gábor Pozsgai)
5. Practical: Sulfide sources, preparation of sulfide solutions (Dr. Gábor Pozsgai)
6. Practical: Detection of sulfide concentration (Dr. Gábor Pozsgai)
7. Practical: Measurement of polysulfide concentration I (Dr. Gábor Pozsgai)
8. Practical: Measurement of polysulfide concentration II (Dr. Gábor Pozsgai)
9. Practical: Investigation of sulfide-ion channel interaction (Dr. Gábor Pozsgai)
10. Practical: Detection of sulfide-albumin interaction I (Dr. Gábor Pozsgai)
11. Practical: Detection of sulfide-albumin interaction II (Dr. Gábor Pozsgai)
12. Lecture: Effect of sulfide on somatic and neuropathic pain I (Dr. Gábor Pozsgai)
13. Lecture: Effect of sulfide on somatic and neuropathic pain II (Dr. Gábor Pozsgai)
14. Lecture: Effect of sulfide on acute and chronic autoimmune inflammation I (Dr. Gábor Pozsgai)
15. Lecture: Effect of sulfide on acute and chronic autoimmune inflammation II (Dr. Gábor Pozsgai)
16. Practical: Methods for the measurement of pain (Dr. Gábor Pozsgai)
17. Practical: Methods for the detection of inflammatory parameters (Dr. Gábor Pozsgai)
18. Lecture: Effect of sulfide in acute stress: behavior (Kitti Göntér)
19. Lecture: Effect of sulfide in acute stress: neuronal activation (Kitti Göntér)
20. Lecture: Effect of sulfide in the animal model of depression: anxiety-like behavior (Kitti Göntér)
21. Lecture: Effect of sulfide in the animal model of depression: depression-like behavior (Kitti Göntér)
22. Lecture: Effect of sulfide in the animal model of depression: neuronal activation I (Kitti Göntér)
23. Lecture: Effect of sulfide in the animal model of depression: neuronal activation II (Kitti Göntér)
24. Practical: Models of depression (Kitti Göntér)
25. Practical: Measurement of anxiety in animals (Kitti Göntér)
26. Practical: Measurement of depression-like behavior in animals (Kitti Göntér)
27. Practical: Detection of neuronal activation I (Göntér Kitti)
28. Practical: Detection of neuronal activation II (Göntér Kitti)

code	instructor in charge	title	credit	host department
OPMU_B-131/1993_SGY2	**Dr. Sétáló, György**	Steroids' alternative (nongenomic) mechanism of action	1	Department of Biology

description	This course is about steroids' mechanism of action. In the classical interpretation these ligands work as regulators of transcription. In recent decades, however, more and more information has been gathered strengthening the existence of alternative possibilities. These are executed either through membrane-bound receptors or via direct membrane effects, activating various signal transduction pathways.

Declaration of the course:

Semester: spring
Application deadline: end of semester's first week
Application: **name:** dr. Sétáló, György Jr.
telephone: ext. 36216 or 31566
email: gyorgy.setalo.jr@aok.pte.hu

Maximum number of attending students: 20
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 7
number of lectures per week: 0.5 (in reality 7 x 1)

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: attending minimum 75% of the classes, then passing the exam successfully
Opportunities for making up for non-attendance: not possible

List of resources (book, note, other) **required for learning the curriculum:** discussed power point presentations will be handed out to participants after the classes

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Orientation (György Sétáló Jr.)
2. Estrogens (György Sétáló Jr.)
3. Progesterone (György Sétáló Jr.)
4. Androgens (György Sétáló Jr.)
5. Corticosteroids (György Sétáló Jr.)
6. Other, steroid-like ligands (György Sétáló Jr.)
7. Test exam (György Sétáló Jr.)

code	instructor in charge	title	credit	host department
OPMU_A-129/1993_SZE1	**Dr. Szabó, Éva**	The significance of trace elements in the context of evidence-based medicine	3	Department of Biochemistry and Medical Chemistry

description	The objective of the PhD course is to elucidate the medical implications of trace elements within the context of evidence-based medicine. Each trace element is discussed in detail: the chemical and biochemical occurrence of the trace element, the physiological significance, absorption, dietary occurrence, deficiency states, acute and chronic toxicoses. Medical significance and indications of each trace element are presented in the form of meta-analyses.

Declaration of the course:

Semester: spring
Application deadline: end of 2nd week of spring semester
Application: **name:** dr. Szabó, Éva
telephone: 31659
email: szabo.eva.dr@pte.hu

Maximum number of attending students: 20
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course
Time frame of education total hours of the course: 20
number of lectures per week: 2

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: absences less than 30%, examination
Opportunities for making up for non-attendance: consultation

List of resources (book, note, other) **required for learning the curriculum:** lecture material in the form of slides

Topics and instructors of the activities (all lectures, practices, seminars separately):

1. Overview of trace elements	Szabó Éva
2-4: Medical importance of iron	Szabó Éva
5-6: Medical importance zinc	Szabó Éva
7-8: Medical importance of copper	Szabó Éva
9-10: Medical importance of iodine	Szabó Éva
11-12: Medical importance of selenium	Szabó Éva
13-14: Medical importance of molybdenum	Szabó Éva
15-16: Medical importance of manganese	Szabó Éva
17: Medical importance of fluoride	Szabó Éva
18: Medical importance of chromium	Szabó Éva
19: Medical importance of other trace elements	Szabó Éva
20: Toxic trace elements	Szabó Éva

code	instructor in charge	title	credit	host department
OPKL_B-4/2004_SZJ1	**Dr. Szalma, József**	Thermal damage of the alveolar bone, periodontium and peripheral nerves in relation to oral surgical and dental treatments	2	Department of Oral and Maxillofacial Surgery
description	In several dental and oral surgery approaches rotating instruments (drills, burs) or piezoelectric preparations are applied. The course represents different clinical parameters, which can influence or reduce harmful temperatures, such as drilling parameters (spindle speed, axial loading, external-, internal or combined irrigation etc.) or drill characteristics (number and angle of cutting edges, drill material, wear etc.). Lectures discuss the methods and tools of intraoperative temperature measurements (infrared technique, thermocouples) and discuss thermal damage of different tissues (bone, periodontal fibers, and peripheral trigeminal nerves), furthermore including the clinical consequences (osteonecrosis, alveolitis, ankyloses, paresthesia).			

Declaration of the course:

Semester: autumn
Application deadline: 07. 09.
Application: **name:** Dr. Szalma József
telephone: 72/535-924 or 35924
email: szalma.jozsef@pte.hu

Maximum number of attending students:15
Criteria of acceptance in case of overbooking: declaration of acceptance from the leader of the course

Time frame of education total hours of the course: 14
number of lectures per week: 2x 45 minutes

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.): attendance of 80% of the classes
Opportunities for making up for non-attendance: -
List of resources (book, note, other) **required for learning the curriculum:** The educational material provided by the lecturers.

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Definition of the osteonecrosis. Clinical consequences of thermal damage of the alveolar bone. Heat tolerance of the periodontium and peripheral nerves and their reaction on thermal damage. (*Szalma József*)
2. The thermal parameters of rotating instruments and piezoelectric preparations used in dentistry, oral surgery and implantology, including literature review of relevant topics of orthopedic-traumatology, neurosurgery. (*Szalma József*)
3. Physical parameters of drills and burs determining intraosseal heat elevations. (*Szalma József*)
4. In vitro bone simulating materials. Comparisons of animal bone and synthetic bone models. (*Szalma József*)
5. The possibilities of registering thermal consequences of rotating and piezoelectric instruments. The accepted heat measurement methods in the literature. Methods of our clinical investigations and its representation. Benefits and limitations. (*Szalma József*)
6. Heat development of composite materials during photo-polymerization and the methods of heat measurements. Harmful temperatures of ultrasonic devices in the periodontium, alveolar bone by removal of endodontic files or intrapulpal posts. (*Lempel Edina* and *Krajczár Károly*)
7. The harmful intraosseal temperatures of orthodontic mini-implant insertions and heat during the predrilling process. Heat reducing strategies and its effect on the clinical success and survival rates. (*Gurdán Zsuzsanna*)

code	instructor in charge	title	credit	host department
OPEL_A-138/1993_SZL1	**Dr. Szereday, László** **Dr. Meggyes, Mátyás**	Principles and techniques of cell separation	4	Medical Microbiology and Immunology
description	No prior knowledge of flow cytometry is assumed. The course will include lectures and practical sessions on applications including Ficoll gradient cell separation, magnetic cell isolation and separation with Miltenyi MACS tecnique and fluorescent labelled cell separation with BD FACS ARIA cytometer (high purity sorting, single cell sorting, cell separation onto microscope slides).			

Declaration of the course:

Semester: both

Application deadline: 1 October / 1 February
Application: **name:** dr. Szereday, László
telephone: 536001/31907
email: szereday.laszlo@pte.hu

Maximum number of attending students: 4
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 24
number of lectures per week: 8
number of practices per week: 16

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: oral exam
Opportunities for making up for non-attendance: No make up lectures and practices.

List of resources (book, note, other) **required for learning the curriculum:** Lecture slides and notes.

Topics and instructors of the activities (all lectures, practices, seminars separately):
Day 1.: Lectures: Principles and different techniques of cell separation (László Szereday and Mátyás Meggyes)

1. Mononuclear cell separation from blood
   1.1. Sample preparation
   1.2. Principle of cell separation
   1.3. Cell counting
2. Magnetic cell separation with Miltényi MACS Microbeads
   2.1. Principle of magnetic cell separation
   2.2. Positive and negative cell separation
3. Fluorescent labelled cell separation with BD FACS ARIA cytometer: high purity sorting, single cell sorting, cell separation onto microscope slides etc.
   3.1. Principle of flow cytometric cell separation
   3.2. Sample preparation
   3.3. Principle of cell separation

Day 2. Practice: Separation of PBMC by Ficoll gradient and magnetic cell isolation and separation with MACS Microbeads (László Szereday and Mátyás Meggyes)
Day 3. Practice: Flow cytometric cell separation (László Szereday and Mátyás Meggyes)

code	instructor in charge	title	credit	host department
OPGY_A-292/1994_SZE1	**Dr. Szőke, Eva, Dr. Tékus, Valéria**	**Modern drug research and development, experimental possibilities in drug development**	3	Department of Pharmacology and Pharmacotherapy
description	The topic will discuss the need for drug development and the history of drug development. We will compare traditional drug discovery and modern drug development. Students will learn about the drug target identification and validation, drug design, and lead molecule selection and testing. They will learn about in vitro, ex vivo and in vivo preclinical drug development, as well as numerous animal experimental methods, as well as the principles of writing ethical license applications. They will learn about clinical phase studies. During the lectures, it will also be possible to practice all the animal experimental methods found in our department.			

Declaration of the course:

Semester: both
Application deadline: 5th of February or 6th of September
Application: **name:** Dr. Szőke, Éva
telephone: 06 20 9951243
email: **eva.szoke@aok.pte.hu**

Maximum number of attending students: 6
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 21
number of lectures per week: 3 (7 weeks)

Type of examination: written
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: active participation in the practices, maximum 3 hours absent, successful exam
Opportunities for making up for non-attendance: -

List of resources (book, note, other) **required for learning the curriculum:**
Materials will be available to students in pdf format.

Topics and instructors of the activities (all lectures, practices, seminars separately):

1.	Basic definitions in pharmacology. What is the reason of the drug development?	Dr Éva Szőke
2.	History of drug development.	Dr Éva Szőke
3.	Traditional and modern drug development.	Dr Éva Szőke
4.	How can we perform drug target validation?	Dr Éva Szőke
5.	Drug design and synthesis.	Dr Éva Szőke
6.	HTS, lead molecule selection and testing.	Dr Éva Szőke
7.	Investigation of drug candidates, in vitro preclinical testing.	Dr Éva Szőke
8.	Investigation of drug candidates, ex vivo preclinical testing.	Dr Éva Szőke
9.	In vivo animal experiments in drug development.	Dr Éva Szőke
10.	Clinical phases studies.	Dr Éva Szőke
11.	Legal aspects in drug development.	Dr Éva Szőke
12.	Serendipity in drug development.	Dr Éva Szőke
13.	In vivo animal experiments in drug development: Acute pain models.	Dr Valéria Tékus
14.	In vivo animal experiments in drug development: Chronic pain models.	Dr Valéria Tékus
15.	In vivo animal experiments in drug development: Animal models of inflammation.	Dr Valéria Tékus
16.	In vivo animal experiments in drug development: Behavioral pharmacological studies I.	Dr Valéria Tékus
17.	In vivo animal experiments in drug development: Behavioral pharmacological studies II.	Dr Valéria Tékus
18.	Minimally invasive interventions without anaesthesia: oral and non-oral intake of medicines in practice.	Dr Valéria Tékus
19.	Calculation of the dose of anaesthetics for different species.	Dr Valéria Tékus
20.	Recognition and alleviation of pain during animal experiments.	Dr Valéria Tékus
21.	Pitfalls in preparation of ethical license applications.	Dr Valéria Tékus

code	instructor in charge	title	credit	host department
OPKL_B-4/2004_TUK1	**Dr. Turzó, Kinga**	Biomaterials and biocompatibility in medicine and dentistry	2	Department of Oral and Maxillofacial Surgery
description	As healthcare improves and people tend to live longer, materials with specific biomedical applications become more and more important. Biomaterials or alloplastic materials are synthetic materials used in devices replacing parts of living systems or to function in intimate contact with the living tissues for any period of time. In the last decades one of the most important research fields of biomedical sciences are the investigation of the biointegration of alloplastic materials and the development of biocompatible materials. The Ph.D. course aims to study these biomaterials and to understand those molecular processes which determine their successful bio- or osseointegration. The most frequently used medical implants are dental implants that serve to substitute human teeth. During our studies we have gained important information's that can be also applied in case of other implants (for e.g. orthopedic implants). Although the bulk properties (mechanical and thermal characteristics) of biomaterials are important with respect to their biointegration, the biological responses of the surrounding tissues to implants are controlled mostly by their surface characteristics (chemistry and structure) because biorecognition takes place at the interface of the implant and host tissue. Biological surface science methods (ESCA, SEM, AFM, etc.) are introduced in the course as well as biocompatibility tests, given by the ISO-10993 standard.			

Declaration of the course:

Semester: autumn
Application deadline: September 7
Application: **name:** Dr. Turzó, Kinga
telephone: 30-4789614
email: turzo.kinga@pte.hu

Maximum number of attending students: 10
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 14
number of lectures per week: 1
number of seminars per week: 1

Type of examination: oral
Type of remedial exam: oral

Criteria of accepting the course (exams, maximum number of absence, etc.).: passing the oral exam, max. 2 lectures absence
Opportunities for making up for non-attendance: None

List of resources (book, note, other) **required for learning the curriculum:**

- Biomaterials Science: An Introduction to Materials in Medicine. Ed. B.D Ratner, A.S. Hoffman, F.J. Schoen, J.E. Lemons. Academic Press, 1996.
- Park, J.B. (2000). Biomaterials, In: The Biomedical Engineering Handbook, 2nd ed., Vol. I, Bronzino, J.D., (Ed.), IV-1-IV-5, CRC Press and IEEE Press, ISBN 0-8493-0461-X, Boca Raton, Florida, USA
- O'Brien, W.J. Dental Materials and Their Selection, 3. ed. Quintessence, ISBN 0-86715-406-3, 2002

- K.J. Anusavice: Phillips' Science of Dental Materials (10th ed), B. Saunders Company, ISBN 0-7216-5741-9, Philadelphia, Pennsylvania, USA, 1996
- Lectures

Topics and instructors of the activities (all lectures, practices, seminars separately):
1. Introduction to biomaterials science. Historical overview. Classes of biomaterials used in dentistry and medicine.
2. Bulk properties of materials 1st part: mechanical and thermal properties of biomaterials.
3. Bulk properties of materials 2nd part: electrical and optical properties of biomaterials.
4. Surface characteristics of biomaterials
5. Investigation methods of the surfaces of biomaterials (contact angle, ESCA, SEM, STM, AFM, SIMS, IRS)
6. Interaction between the host and biomaterial: host reactions to biomaterials and response of biomaterials to implantation and degradation of biomaterials in the biological environment.
7. Biomaterials made of metals (stainless steels, Co-Cr alloys, Ti alloys and metals used in dentistry)
8. Biointegration and osseointegration of titanium implants.
9. Physical-chemical and biochemical surface modifications of dental implants. Thin films, coatings and fabrics.
10. Biomaterials made of polymers, types of polymers, polymerization, mechanical and thermal properties.
11. Ceramics and bioceramics (bioinert, calcium-phosphate ceramics, bioactive glasses)
12. Composites as biomaterials. Natural materials (proteins, polysaccharides, polynucleotide's). Hydrogels, bioresorbable and bioerodible materials.
13. Biocompatibility tests (ISO-10993 Standard).
14. Testing biomaterials (*in vitro*, *in vivo* assessment, animal models and biomechanical tests).

code	instructor in charge	title	credit	host department
OPEL_A-137/1993_ZED1	**Dr. Zelena, Dóra**	Preclinical examination of psychiatric diseases	3	Department of Physiology
description	Nowadays, psychiatric illnesses are becoming more common, partly due to increasing stress (eg anxiety, depression) and partly due to an aging society (eg dementia). Unfortunately, their therapy is not solved. A better understanding of the underlying mechanisms can bring us closer to discovering new drug targets. To do this, as well as testing new drugs, appropriate animal models and tests are required. Students will be able to get acquainted with the classification of psychiatric diseases, their main symptoms, and get a comprehensive picture of possible preclinical models and available as well as new methods under development. Special focus will be given to new research areas such as viral vectors, opto- and pharmacogenetics, epigenetics and "big data" and we will present their potential role in diagnosis and therapy.			

Declaration of the course:

Semester: autumn
Application deadline: August 31
Application: **name:** dr. Zelena, Dóra
telephone: +36-20-9251954
email: dora.zelena@aok.pte.hu

Maximum number of attending students: 60
Criteria of acceptance in case of overbooking: order of application

Time frame of education total hours of the course: 24
lectures only, 1-12 weeks of the semester, 2 hours per week

Type of examination: written
Type of remedial exam: written

Criteria of accepting the course (exams, maximum number of absence, etc.).: passing the oral exam, maximum absence 3 hours, passing a written test
Opportunities for making up for non-attendance: None

List of resources (book, note, other) **required for learning the curriculum:**
ppt from the lectures
Topics and instructors of the activities (all lectures, practices, seminars separately):
1-2 Introduction: Categorization of psychiatric diseases, validity of animal models
3-4 The role of motion in preclinical studies, the Parkinson and Huntington's disease, viral vectors in therapy
5-6 Circadian rhythm, speel-wakefulness, EEG, major regulators and role in the development and research of psychiatric diseases
7-8 Anxiety and posttraumetic stress disorder
9-10 Mania and depression: Can it be positive?
11-12 Learning and memory, from elementary processes till complex tests
13-14 Dementia, Alzheimer's Disease, an important problem of our aging society, "big data" data collection (proteomica, lipidomica, etc.) and possibilities their usefullness in psychiatry
15-16 Social behavior, friendship and aggression in animals and sick people from mechanisms to therapeutic options. Opto- and pharmacogenetic methods in research.
17-18 Drugs and addiction. Everyone is addicted?
19-20 Schizophrenia and autism
21-22 The relationship of psychiatric diseases with metabolism, the brain-gut axis and the vagus in the development and therapy of diseases
23-24 Examination

The accredited Doctoral Schools of the University of Pécs under the competence of the the Doctoral Council and Habilitation Committee of Medical and Pharmaceutical Sciences, their programmes and leaders

		leader of the Doctoral School / Program leader
Basic Medical Sciences D95	**Dr Reglődi, Dóra**	
A-138/1993	Immunological aspects of reproduction	Dr Mikó, Éva
B-139/1993	Essentials of immunology	Dr Berki, Tímea
B-372/1996	Immunological and clinical aspects of polisystemic autoimmune conditions	Dr Varjú, Cecília
A-137/1993	Theoretical and practical guidance for the multidisciplinary research of the central neural and humoral regulation	Dr Zelena, Dóra
B-134/1993	Neuroendocrinology and neurohistology	Dr Reglődi, Dóra
B-377/1997	Behavioural sciences	Dr Csathó, Árpád
A-141/1993	Molecular pathogenesis of bacterial infections	Dr Kerényi, Mónika
Clinical Medical Sciences D94	**Dr Bogár, Lajos**	
A-319/1995	Nephrology - Diabetology	Dr Wittmann, István
A-442/2000	Reproductive endocrinology	Dr Kovács, Kálmán
A-146/1993	Significance of molecular pathological and laboratory studies in medical diagnostics and therapy	Dr Miseta, Attila
B-145/1993	Molecular pathomorphology	Dr Kajtár, Béla
A-327/1995	Investigation of circulatory pathological conditions in experimental models and clinical patient material	Dr Jancsó, Gábor
B-322/1996	Cardiovascular and occupational health-operational medicine	Dr Tóth, Kálmán
B-149/1993	Molecular epidemiology of tumours	Dr Kiss, István
B-414/1998	Nutrition studies in childhood	Dr Erhardt, Éva
B–2/2004	The clinical and molecular research of the new mechanisms, diagnostics and therapy of cardiovascular diseases	Dr Szokodi, István
B–4/2004	Basic and applied research in dental and oral diseases	Dr Nagy, Ákos Károly
B-1/2006	Clinical aspects and pathobiochemistry of metabolic and endocrine diseases	Dr Mezősi, Emese
B-1/2008	Surgery and its border fields	Dr Vereczkei, András
B-1/2010	Clinical studies on locomotion	Dr Than, Péter
B-2/2013	Functional injuries of parenchymal organs and the consequences: clinical and interdisciplinary approaches	Dr Szántó, Zalán

Clinical Neurosciences D221 **Dr Janszky, József**

B-1/2005	Clinical neuroimmunology and stroke	Dr Szapáry, László
B-2/2014	Neuromorphology and neuropathology	Dr Ábrahám, Hajnalka
B-3/2014	Imaging in neuroscience	Dr Bogner, Péter
B-4/2014	Neurosurgery	Dr Schwarcz, Attila
B-5/2014	Clinical and human neurosciences	Dr Janszky, József
B-6/2014	Neurology	Dr Pfund, Zoltán
B-1/2012	Psychiatry	Dr Tényi, Tamás

Interdisciplinary Medical Sciences D93 **Dr Gallyas, Ferenc**

A-129/1993	Molecular and cellular biochemistry	Dr Gallyas, Ferenc
B-130/1993	Investigating functional protein dynamics using biophysical methods	Dr Nyitrai, Miklós
B-131/1993	Intracellular signal transduction pathways	Dr Sétáló, György
B-299/1995	Haematology	Dr Alizadeh, Hussain
B-449/1999	Human Molecular Genetics	Dr Gallyas, Ferenc
B-2/2008	Evidence based medicine	Dr Decsi, Tamás
B–1/2013	Analytic techniques in biochemistry and molecular biology	Dr Gallyas, Ferenc

Pharmacology and Pharmaceutical Sciences D92 **Dr Pintér, Erika**

A- 148/1993	The isolation and examination of biologically active compounds	Dr Deli, József
A-143/1993	Optimization of pharmacotherapy	Dr Botz, Lajos
B-1/2014	Pharmaceutical chemistry	Dr Perjési, Pál
A-144/1994	Toxicology	Dr Pethő, Gábor
B–1/2004	The role of neuroimmune interactions in pain and inflammation	Dr Helyes, Zsuzsanna
A-292/1994	Neuropharmacology	Dr Pintér, Erika
B-1/2016	Translational Medicine	Dr Hegyi, Péter