



LITHUANIAN SPORTS UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	B	740	B	004	Accredited until				Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Basics of Pharmacology

Prerequisites

Anatomy, physiology, biochemistry, pathology

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	Be able to find and understand modern scientific ideas arising from fundamental and applied interdisciplinary science and proven practice.	Discussion, Interactive lecture, Literature analysis, Scientific paper analysis	Scientific paper (text) analysis
2	Be able to select, understand and interpret the latest knowledge of pharmacology science.	Discussion, Interactive lecture, Literature analysis, Scientific paper analysis	Scientific paper (text) analysis
3	Be able to understand the principles of application of pharmacological preparations in the case of individual diseases.	Discussion, Literature review presentation, Practical exercises (tasks), Problem-based learning	Mid-term examination
4	Be able to understand the principles of action, dosage and side effects of drugs.	Discussion, Literature review presentation, Practical exercises (tasks), Problem-based learning	Mid-term examination

Main aim

To provide the latest scientific knowledge in pharmacology, the ability to find and understand modern scientific ideas.

Summary

Methods of drug use, drug absorption, mechanism of action, excretion, side effects, placebo effect. CNS active substances, Non-steroidal anti-inflammatory drugs, Antihistamines, cardiac drugs, respiratory and digestive enhancers, antibacterial drugs, vitamins, hormones, food supplements.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	
		Bendrojo universitetinio lavinimo

Group under financial classification

Syllabus

№.	Sections and themes	Responsible lecturer
1.	General pharmacology. Routes of drug distribution in the body.	
2.	General pharmacology. Pharmacokinetics	
3.	General pharmacology. Pharmacodynamics (antagonists, agonists)	
4.	General pharmacology. Pharmacodynamics (response of the body to drugs)	
5.	Special pharmacology. Pharmacology of cardiac pathology	
6.	Special pharmacology. Pharmacology of gastrointestinal pathology	
7.	Drugs that affect coagulation and hematopoiesis (direct and indirect anticoagulants, drugs for the treatment of ferrodeficiency anemia). Indications, side effects.	
8.	Special pharmacology. Pharmacology of pathology of the autonomic system	
9.	Special pharmacology. Pharmacology of pathology of infectious diseases	
10.	Special pharmacology. Antibacterial medications.	

No.	Sections and themes	Responsible lecturer
11.	Special pharmacology. Pain relief	
12.	Special pharmacology. Fat soluble vitamins.	
13.	Special pharmacology. Water soluble vitamins.	
14.	Special pharmacology. Food supplements	
15.	Special pharmacology. Pharmacology of respiratory pathology.	
16.	Special pharmacology. Drugs	
17.	Special pharmacology. Treatment of Parkinson's disease.	
18.	Special pharmacology. Pharmacology of thyroid pathology.	
19.	Special pharmacology. Amyotrophic Lateral Sclerosis	
20.	Special pharmacology. Pharmacology of renal pathology	

Evaluation procedure of knowledge and abilities:

References

No.	Title	Edition in Lithuanian Sports University library		In Lithuanian Sports University bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
1.	Bendroji ir klinikinė farmakologija: vadovėlis / sudarė Bertram G. Katzung. 2007	615 Be-191	12	Yes	
2.	Practical pharmacology in rehabilitation : effect of medication on therapy / L. L. Carl, J. A. Gallo, P. R. Johnson. Champaign : Human kinetics, 2014	615 Ca217	1	Yes	
3.	Physical therapy pharmacology / Lynne Eddy. Vadovėlis/ St. Louis : Mosby, 1992	615 Ed-04	1	Yes	
4.	Farmakologija ir receptūra : vadovėlis / Romualdas Basevičius, Vytautas Budnikas, Algis Mickis, Henrikas Mituzas 1986	615 Fa403	2	Yes	
5.	Farmakologija : gydytojo odontologo padėjėjui : mokomoji knyga / Nijolė Ona Naruševičienė ; Panevėžio kolegija. 2004	615 Na206	10	Yes	
6.	Farmakologija : vadovėlis / R. Basevičius, V. Budnikas, A. Mickis 1986	615 Fa403	2	Yes	
7.	Autonominė nervų sistema: fiziologija, pataloginė fiziologija, farmakologija, imunologija / G. Civinskienė, L. Malcienė, G. V. Sakalauskienė, R. Sveikatiienė, B. Šitkauskienė.2019	616.8 Au75	5	Yes	
8.	Peter J. Nelsona and Stuart J. Shankl Therapeutics in Renal Disease: The Road Ahead for Antiproliferative Targets Nephron Exp Nephrol. 2006 ; 103(1): e6–15.			No	
9.	Meghan E Feltcher, Jonathan Tabb Sullivan, and Miriam Braunstein Protein export systems of Mycobacterium tuberculosis: novel targets for drug development? Future Microbiol. 2010 October ; 5: 1581–1597.			No	
10.	Clifton E Barry, Helena Boshoff, Véronique Dartois, Thomas Dick, Sabine Ehrt, JoAnne Flynn, Dirk Schnappinger, Robert J Wilkinson, and Douglas Young The spectrum of latent tuberculosis: rethinking the goals of prophylaxis Nat Rev Microbiol. 2009 December ; 7(12): 845–855.			No	

№.	Title	Edition in Lithuanian Sports University library		In Lithuanian Sports University bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
11.	Shashikant Srivastava, Jotam G. Pasipanodya, Claudia Meek, Richard Leff and Tawanda Gumbo Multidrug-Resistant Tuberculosis Not Due to Noncompliance but to Between-Patient Pharmacokinetic Variability The Journal of Infectious Diseases 2011;204:1951–9			No	
12.	Meghna Adhvaryu, Bhasker Vakharia Drug-resistant tuberculosis: emerging treatment options Clinical Pharmacology: Advances and Applications 2011;3 51–67			No	
13.	Rohit Vashisht and Samir K Brahmachari Metformin as a potential combination therapy with existing front-line antibiotics for Tuberculosis Journal of Translational Medicine (2015) 13:83			No	
14.	Cedric P Owens, Nicholas Chim and Celia W Goulding Insights on how the Mycobacterium tuberculosis heme uptake pathway can be used as a drug target Future Med Chem. 2013; 5(12)			No	
15.	Peng Li, Yingxue Fu, Jinlong Ru, Chao Huang, Jiangfeng Du, Chunli Zheng, Xuotong Chen, Pidong Li, Aiping Lu, Ling Yang and Yonghua Wang Insights from systems pharmacology into cardiovascular drug discovery and therapy BMC Systems Biology (2014) 8:141			No	
16.	Eric Thorin and Martine Clozel The Cardiovascular Physiology and Pharmacology of Endothelin-1 Adv Pharmacol. 2010 ; 60: 1–26.			No	
17.	Anastasios Lymperopoulos Physiology and pharmacology of the cardiovascular adrenergic system Front. Physiol., 2013, 4:240			No	
18.	Bruno K Rodiño-Janeiro, Beatriz Paradelo-Dobarro, María Isabel Castiñeiras-Landeira, Sergio Raposeiras-Roubín, José R González-Juanatey, Ezequiel Álvarez Current status of NADPH oxidase research in cardiovascular pharmacology Vascular Health and Risk Management 2013;9 401–428			No	
19.	Robert J Balch, Andrea Trescot Extended-release morphine sulfate in treatment of severe acute and chronic pain Journal of Pain Research 2010;3 191–200			No	
20.	Avinash K Bhandary, Gary P Chimes, Gerard A Malanga Investigational pharmacology for low back Pain Journal of Pain Research 2010;3 169–181			No	
21.	Daniel E. Becker Basic and Clinical Pharmacology of Glucocorticosteroids Anesth Prog 60:25–32 2013			No	
22.	Joseph G McGivern Ziconotide: a review of its pharmacology and use in the treatment of pain Neuropsychiatric Disease and Treatment 2007;3(1) 69–85			No	
23.	Kyung Hoon Kim, and Salahadin Abdi Rediscovery of Nefopam for the Treatment of Neuropathic Pain Korean J Pain 2014 April; Vol. 27, No. 2: 103-111			No	

№.	Title	Edition in Lithuanian Sports University library		In Lithuanian Sports University bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
24.	Leontiadis GI, Sreedharan A, Dorward S, Barton P, Delaney B, Howden CW, Orhewere M, Gisbert J, Sharma VK, Rostom A, Moayyedi P, Forman D. Systematic reviews of the clinical effectiveness and cost-effectiveness of proton pump inhibitors in acute upper gastrointestinal bleeding. <i>Health Technol Assess.</i> 2007 Dec;11(51):iii-iv, 1-164.			No	
25.	Grigoleit HG, Grigoleit P. Gastrointestinal clinical pharmacology of peppermint oil <i>Phytomedicine.</i> 2005 Aug;12(8):607-11.			No	
26.	Brogden RN, Carmine AA, Heel RC, Speight TM, Avery GS. Ranitidine: a review of its pharmacology and therapeutic use in peptic ulcer disease and other allied diseases <i>Drugs.</i> 1982 Oct;24(4):267-303.			No	
27.	Stefan Müller-Lissner The Pathophysiology, Diagnosis, and Treatment of Constipation <i>Dtsch Arztebl Int</i> 2009; 106(25): 424–32			No	
28.	Sara Lustigman, Roger K. Prichard, Andrea Gazzinelli, Warwick N. Grant, Boakye A. Boatin, James S. McCarthy, Mari 'a-Gloria Basa 'n ez A Research Agenda for Helminth Diseases of Humans: The Problem of Helminthiasis <i>PLoS Negl Trop Dis.</i> 2012, Volume 6, Issue 4, e1582			No	
29.	Charlotte I.S. Barker, Eva Germovsek, Rollo L. Hoare, Jodi M. Lestner, Joanna Lewis and paediatric infectious diseases and immunology <i>Adv Drug Deliv Rev.</i> 2014 Jun 30; 73(100): 127–139.			No	
30.	Lynn L. Silver Challenges of Antibacterial Discovery <i>Clinical Microbiology Reviews,</i> Jan. 2011, p. 71–109			No	

Additional literature

№.	Title
1.	D. Desai and C. Brightling Cytokine and anti-cytokine therapy in asthma: ready for the clinic? <i>Clinical and Experimental Immunology,</i> 2009, 158: 10–19
2.	Jenna R. Murdoch and Clare M. Lloyd Chronic inflammation and asthma <i>Mutat Res.</i> 2010 Aug 7; 690(1-2): 24–39.
3.	Meyer S. Balter, Alan D. Bell, Alan G. Kaplan, Harold Kim, R. Andrew McIvor Management of asthma in adults <i>CMAJ</i> • 2009, 181(12), 915-922
4.	Julie C. Antvorskov, Knud Josefsen, Kåre Engkilde, David P. Funda & Karsten Buschard Dietary gluten and the development of type 1 diabetes <i>Diabetologia</i> (2014) 57:1770–1780
5.	Thomas Reinehr Type 2 diabetes mellitus in children and adolescents <i>World J Diabetes</i> 2013 December 15; 4(6): 270-281
6.	Angela Dardano, Giuseppe Penno, Stefano Del Prato, and Roberto Miccoli Optimal therapy of type 2 diabetes: a controversial challenge <i>AGING,</i> March 2014, Vol. 6 No.3, 187-206
7.	Ryan W. Grant and Vishwa D. Dixit Mechanisms of disease: inflammasome activation and the development of type 2 diabetes <i>Frontiers in Immunology,</i> 2013, Volume4, Article50
8.	J.-M. Kaufman, J.-Y. Reginster, S. Boonen, M. L. Brandi, C. Cooper, W. Dere, J.-P. Devogelaer, A. Diez-Perez, J. A. Kanis, E. McCloskey, B. Mitlak, E. Orwoll, J.D. Ringe, G. Weryha, R. Rizzoli Treatment of osteoporosis in men Europe PMC Funders Group, <i>Bone.</i> 2013 March ; 53(1): 134–144

№.	Title
9.	J. A. Kanis, E. V. McCloskey, H. Johansson, C. Cooper, R. Rizzoli & J.-Y. European guidance for the diagnosis and management of osteoporosis in postmenopausal women <i>Osteoporos Int</i> (2013) 24:23–57
10.	Myoung Suk Seo, Elizabeth Scarr, Chi-Yu Lai, Brian Dean Potential Molecular and Cellular Mechanism of Psychotropic Drugs <i>Clinical Psychopharmacology and Neuroscience</i> 2014;12(2):94-110
11.	Tomiki Sumiyoshi Antipsychotic treatments; focus on lurasidone <i>Frontiers in Pharmacology, Neuropharmacology</i> , 2013; 4; 102
12.	OD Howes, A Egerton, V Allan, P McGuire, P Stokes and S Kapur Mechanisms underlying psychosis and antipsychotic treatment response in schizophrenia: insights from PET and SPECT imaging <i>Curr Pharm Des.</i> 2009 ; 15(22): 2550–2559.
13.	James M. Stone Glutamatergic antipsychotic drugs: a new dawn in the treatment of schizophrenia? <i>Ther Adv Psychopharmacol</i> (2011) 1(1) 5–18
14.	Kimberly Renk, Rachel White, Brea-Anne Lauer, Meagan McSwiggan, Jayme Puff, and Amanda Lowell Bipolar Disorder in Children <i>Psychiatry Journal</i> 2014, Article ID 928685, 19 pages
15.	Jeffrey A. Loeb Identifying targets for preventing epilepsy using systems <i>Biology Neurosci Lett.</i> 2011 June 27; 497(3): 205–212.
16.	Alina Solomon, Francesca Mangialasche, Edo Richard, Sandrine Andrieu, David A. Bennett, Monique Breteler, Laura Fratiglioni, Babak Hooshmand, Ara S. Khachaturian, Lon S. Schneider, Ingmar Skoog and Miia Kivipelto Advances in the prevention of Alzheimer’s disease and dementia <i>J Intern Med.</i> 2014 March ; 275(3): 229–250. 40. Jerry J Shih, William O Tatum, Leslie A Rudzinski New drug classes for
17.	Jerry J Shih, William O Tatum, Leslie A Rudzinski New drug classes for the treatment of partial onset epilepsy: focus on perampanel <i>Therapeutics and Clinical Risk Management</i> 2013;9 285–293
18.	Christine Konradi and Stephan Heckers Antipsychotic Drugs and Neuroplasticity: Insights into the Treatment and Neurobiology of Schizophrenia <i>Biol Psychiatry.</i> 2001 November 15; 50(10): 729–742.
19.	John R Geddes and David J Miklowitz Treatment of bipolar disorder <i>Lancet.</i> 2013 May 11; 381(9878):
20.	Jason J. Washburn, Amy E. West, and Jennifer A. Heil Treatment of Pediatric Bipolar Disorder: A Review <i>Minerva Psichiatr.</i> 2011 March ; 52(1): 21–35.
21.	Kristina I. Rother Diabetes Treatment — Bridging the Divide <i>N Engl J Med.</i> 2007 April 12; 356(15): 1499–1501
22.	Anu Rahal, Abul Hasan Ahmad, Atul Prakash, Rajesh Mandil and Aruna T. Kumar Environmental Attributes to Respiratory Diseases of Small Ruminants <i>Veterinary Medicine International</i> , 2014, Article ID 853627, 10 pages
23.	Martin J. Wolff, Mara J. Broadhurst, and P’ng Loke Helminthic therapy: improving mucosal barrier function <i>Trends Parasitol.</i> 2012 May ; 28(5): 187–194.
24.	Stephen T. Abedon Phage Therapy: Eco-Physiological Pharmacology <i>Scientifica</i> , Volume 2014, Article ID 581639, 29 pages
25.	Håvard Jenssen, Pamela Hamill, and Robert E. W. Hancock Peptide Antimicrobial Agents <i>Clinical Microbiology Reviews</i> , July 2006, p. 491–511
26.	Chee Wah Tan, Jeffrey Kam Fatt Lai I-Ching Sam and Yoke Fun Chan Recent developments in antiviral agents against enterovirus 71 infection <i>Journal of Biomedical Science</i> 2014, 21:14
27.	Russell E. Lewis Current Concepts in Antifungal Pharmacology <i>Mayo Clin Proc.</i> • August 2011;86(8):805-817
28.	Brian E. Lacy, John M. Levenick and Michael Crowell Chronic constipation: new diagnostic and treatment approaches <i>Ther Adv Gastroenterol</i> (2012) 5(4) 233–247
29.	Colleen H. Parker, Yuhong Yuan and Louis Wing Cheong Liu Linaclotide: a new option for the treatment of irritable bowel syndrome with constipation and chronic idiopathic constipation in adults <i>Clinical Medicine Insights: Gastroenterology</i> 2013;6 21–32
30.	Nicholas A. Moore, Bruce J. Sargent, David D. Manning, and Peter R. Guzzo Partial Agonism of 5-HT ₃ Receptors: A Novel Approach to the Symptomatic Treatment of IBS-D <i>ACS Chem. Neurosci.</i> 2013, 4, 43–47
31.	LWC Liu. Chronic Constipation: Current treatment options. <i>Can J Gastroenterol</i> 2011;25(suppl B):22B-28B.

№.	Title
32.	Mark J.C.Nuijten, DominiqueJ.Dubois, AlainJoseph and LievenAnnemans Cost effectiveness of prucalopride in the treatment of chronic constipation in the Netherlands <i>Frontiers in Pharmacology</i> , April 2015, 6, 67
33.	Sobczak M, Sałaga M, Storr MA, Fichna J. Physiology, signaling, and pharmacology of opioid receptors and their ligands in the gastrointestinal tract: current concepts and future perspectives. <i>J Gastroenterol.</i> 2014 Jan;49(1):24-45
34.	Anne Lespine, Cécile Ménez, Catherine Bourguinat, Roger K. Prichard P-glycoproteins and other multidrug resistance transporters in the pharmacology of anthelmintics: Prospects for reversing transport-dependent anthelmintic resistance <i>International Journal for Parasitology: Drugs and Drug Resistance</i> 2 (2012) 58–75
35.	John Q. Trojanowskia, Steven E. Arnolda, Jason H. Karlawisha, Mary Naylora, Kurt R. Brundena,b,c, and Virginia M.-Y. Lee A model for improving the treatment and care of Alzheimer’s disease patients through interdisciplinary research <i>Alzheimers Dement.</i> 2012 November ; 8(6): 564–573.
36.	Jun H. Lee1 and Anjan Nan Combination Drug Delivery Approaches in Metastatic Breast Cancer <i>Journal of Drug Delivery</i> Volume 2012, Article ID 915375, 17 pages

Coordinating lecturer

Position	Degree, surname, name	Schedule №.

Subdivision

Entitlement	Code
	40

Study module teaching form №. 1

Semester	Mode of studies	Structure				Total hours	Credits	
		Theory	Seminars	Lab Works	Ind. work			
A	S	D	8	22	0	100	130	5

Languages of instruction:

Lithuanian	L	English	E	Russian	R	French	F	German	G	Other	Oth.
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Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Theory	Seminars	Lab Works		Theory	Seminars	Lab Works
1.	1	1	0	10.	1	2	0
2.	0	1	0	11.	1	2	0
3.	0	1	0	12.	1	1	0
4.	1	1	0	13.	1	1	0
5.	0	1	0	14.	0	2	0
6.	1	1	0	15.	0	1	0
7.	0	2	0	16.	0	2	0
8.	1	1	0	17.	0	1	0
9.	0	1	0				
				Total:	8	22	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20				
Scientific paper (text) analysis	1-20	30	25	*											0									
Scientific paper (text) analysis	1-20	30	25		*										0									
Mid-term examination	1-10	20	25			*												0						

