COURSE UNIT DESCRIPTION

Course unit title	Code
Critical Care Medicine, Transfusiology and Toxicology	

Lecturer(s)	Department(s)
Coordinating: Prof. Dr. (HP) Jūratė Šipylaitė **Others:** Institute of Clinical Medicine, Clinic of Anaesthesiology and Intensive Care lecturers	Faculty of Medicine, Institute of Clinical Medicine, Clinic of Anaesthesiology and Intensive Care, Santariskiu str. 2, Vilnius

Cycle	Level of the course unit	Type of the course unit
First cycle (integrated studies)		Compulsory

Mode of delivery	Period of delivery	Language of instruction
Face-to-face, lectures and seminars in the auditorium, practice in the operating theatre, intensive care unit and simulator class.	Year V, semester X	Lithuanian, English

Prerequisites and corequisites	
Prerequisites: A student must have completed the following courses: human anatomy, human physiology, pharmacology, pathology, general surgery, general medicine (propedeutics) and patient care, anaesthesiology and reanimathology.	**Corequisites** (if any): NONE

Number of ECTS credits allocated to the course unit	Total student's workload	Contact hours	Self-study hours
5	135	66	69

Purpose of the course unit Programme competences to be developed
The purpose of the course is to teach the principles of safe intensive care, etiology, pathophysiology and diagnosis making in critical states and intoxications, also the principles of management, treatment and prophylaxis. Graduates should be trained to diagnose and treat the critical states and intoxications, the patient in shock, acute respiratory failure, severe trauma and coma, also evaluate the vital signs, the severity and life threatening aspects of these cases, and provide resuscitation when needed.

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
General competence acquired by the student during the course:		
Be honest and behave according to the basic ethical principles, be critical and self-critical in decision-making, be creative, show initiative at work and focus on the main purposes, also being good member of the team.	Practical training in the intensive care unit, also in the mannequin-simulator class.	Continuous evaluation of knowledge and skills achieved in the intensive care unit and mannequin-simulator class.
To analyze and systemize the gained information and knowledge, be able to seek for additional information on his own, be able to apply his knowledge in clinical practice, and	Practical training in the intensive care unit, also in	Continuous evaluation of knowledge and skills achieved

know the limits of his competence and seek for help from colleagues in a timely manner, solve the problems and make decisions, communicate with experts from other specialties.	the mannequin simulator class.	in the intensive care unit and mannequin-simulator class.
Specialty competence acquired by the student during the course:		
Basic evaluation and consulting of the critically-ill patient, recognizing the life-threatening arrhythmias, also deterioration of breathing and circulation.	Analysis and discussion of the clinical cases in the intensive care unit.	Seminars for continuous evaluation of knowledge and skills achieved in intensive care and simulator class. Exam in writing at the end of course.
Evaluation of clinical condition and diagnosing the life-threatening states, determining indications for intensive care, determining the plan of diagnostic evaluation and care, perform the differential diagnosis in cases of acute respiratory failure, shock and coma.	Practical training in the intensive care unit, also in the mannequin-simulator classes.	Continuous evaluation of knowledge and skills achieved in the intensive care unit and mannequin-simulator classes, also during analysis of clinical cases.
Skills in application principles of safe intensive care, evidence-based clinical judgment in the diagnosis-making and treatment, also in discussing the clinical cases.	Practical training in the intensive care unit, also in the mannequin-simulator classes and workshop-stations, lectures.	Continuous evaluation of knowledge and skills achieved in the intensive care unit, also during analysis of clinical cases. Exam in writing at the end of course.
Understanding the principles of efficient medical communication with patient and his relatives.	Practical training in the intensive care unit.	Continuous evaluation of knowledge and skills achieved in the intensive care unit, also during analysis of clinical cases.
Take appropriate care of medical documentation and its storage, also be IT fluent, be able to obtain and manage the up-to-date specialty information resources, make digital posters and presentations.	Seminars, practical training in the intensive care unit, and self-education.	Continuous evaluation of knowledge and skills achieved in the intensive care unit, also during analysis of clinical cases.

Topics	**Contact work hours**							**Time and tasks of self-study**	
	Lectures	Consultations	Seminars	Practice	Laboratory work	Practical training	**Total contact hours**	**Self-education**	**Tasks**
Basic and advanced life support. Resuscitation in the hospital.	2						**2**	**2**	Prepare about resuscitation, also algorithms of basic and advanced life support, and principles of post-resuscitation patient care.
Main elements of treatment in intensive care. Effective communication about critically ill patient. Analysis of clinical cases.				2			**2**	**2**	Prepare about the main elements of intensive care treatment, structured and effective transferring of information about critilly ill patient. Main principles of communication with patient relatives.
Gastrointestinal failure in the ICU Enteral and parenteral nutrition: evaluating the deterioration of and			3	2			**5**	**5**	Prepare about the administration of enteral and parenteral nutrition: basics of metabolism

individual needs for nutrition, setting the nutrition-plan, and its specifics in different critical states of patients. Gastrointestinal failure, intraabdominal hypertension.									in critically-ill, indications for enteral and parenteral nutrition, related contraindications and complications, the nutrition-plan and its context-sensitive specifics in association with different pathological states such as sepsis and others.
Urogenital system Acute renal failure, renal replacement therapy. Infusion and transfusion therapy.	1		1	2			**4**	**4**	Prepare about physiology of body fluid handling, evaluation of fluid deficits, specifics of the content and action of different intravenous solutions (crystalloids and colloids), indications and procedures of blood component transfusion, complications and specific considerations during massive haemorrhage. Renal replacement therapy during acute renal failure.
Bleeding, shock. Transfusion therapy. Polytrauma.	2		1	1			**4**	**4**	Prepare about shock classification, diagnosis-making, patterns of hemodynamics and principles of their evaluation in systemic and regional circulation, also the treatment of shock including the plan for infusion therapy, on the diagnostic and treatment priorities in trauma patient, also the principles of related intensive therapy measures.
Initial evaluation and treatment of critically ill patients in prehospital period and emergency department. Systems for evaluation of the patient. Indications for treatment in the ICU. Ethics. End-of-life decisions.	2		3	3			**8**	**8**	Prepare about the structure of intensive care unit, requirements for the ICU personnel, indications for treatment in and discharge from the ICU, specifics and ethical considerations in dealing with ICU patients.
Nosocomial infection.	2		1	1			**4**	**4**	Prepare about origin of nosocomial (hospital-acquired) infection, mechanism of resistance to antibiotics, risk factors and prophylaxis measures in ICU, also principles of catheter care and wound treatment, and setting up the overall treatment plan.
Infection, sepsis and organ dysfunction.	2		1	1			**4**	**4**	Prepare about diagnosis-making in sepsis and multiple organ dysfunction, also infection related laboratory analyses, the plan of treatment and selection of appropriate antibiotic therapy.
Respiratory system Acute respiratory failure: evaluation, oxygen therapy and monitoring.			2	1			**3**	**3**	Prepare about acute respiratory failure, the related diagnosis-making and treatment, oxygen

Methods for the mechanical ventilation of lungs.									therapy and evaluation of breathing, methods of mechanical ventilation of lungs.
Cardiovascular dysfunction, diagnosis and treatment.	2		2	3			**7**	**7**	Prepare about pathophysiology of cardiovascular dysfunction, shock, diagnosis, also monitoring and treatment modes.
Central nervous system Coma; seizures; stroke. Main principles of neuroprotection. Severe brain injury.	1		3	2			**6**	**6**	Prepare about principles of neuroprotection, coma, differential diagnosis, treatment.
Classification of toxins and intoxications, stratification of severity, the diagnosis-making, also the main principles and methods of treatment. Forms of prevention measures and information management.	2		2	3			**7**	**7**	Prepare about toxins, mechanisms of their action, administration of antidotes, measures of primary care and principles of xenobiotics metabolism.
Intoxicating substances: medications and drugs, organic substances, toxic gases, methemoglobin creating substances and others.			2	3			**5**	**5**	Prepare about most common intoxications and principles of the primary care and treatment.
Presentation and analysis of clinical case.			5				**5**	**8**	To prepare the presentation of the clinical case according to the topic given in advance by the teacher.
Total	**16**		**26**	**24**			**66**	**69**	

Assessment strategy	**Weight (%)**	**Assessment period**	**Assessment criteria**
Examination	100 %	According to the schedule	The test is composed of 65 questions (of different complexity, from understanding to assessment). The assessment is as follows: 10 (Excellent): Excellent performance, outstanding knowledge and skills. 95-100 % correct answers. 9 (Very good): Strong performance, good knowledge and skills 85-94 % correct answers. 8 (Good): Above the average performance, knowledge and skills 75-84 % correct answers. 7 (Highly satisfactory): Average performance, knowledge and skills with unessential shortcomings 65-74 % correct answers. 6 (Satisfactory): Below average performance, knowledge and skills with substantial shortcomings. 55-64 % correct answers. 5 (Sufficient): Knowledge and skills meet minimum criteria. 45-54 % correct answers. 4, 3, 2, 1 (Insufficient): Knowledge and skills do not meet minimum criteria/below minimum criteria. 0-44 % correct answers. Failed.

Author	**Year of publication**	**Title**	**No of periodical or vol. of publication**	**Publication place and publisher or Internet link**

Required reading				
European Resuscitation Council	2021	Resuscitation guidelines		https://cprguidelines.eu
	2016	Guidelines for the Management of Severe Traumatic Brain Injury 4th Edition, 2016		https://braintrauma.org/coma/guidelines/guidelines-for-the-management-of-severe-tbi-4th-ed
	2015	Practice Guidelines for Perioperative Blood Management An Updated Report by the American Society of Anesthesiologists Task Force on Perioperative Blood Management		http://www.asahq.org
	2021	Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock 2021		https://www.sccm.org/Clinical-Resources/Guidelines/Guidelines/Surviving-Sepsis-Guidelines-2021
R. Rosaint et al.	2023	The European guideline on management of major bleeding and coagulopathy following trauma: sixth edition		https://ccforum.biomedcentral.com/articles/10.1186/s13054-023-04327-7
S.A. McClave et al.	2016	Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.). Journal of Parenteral and Enteral Nutrition (2016) 40 (2): 159 – 211.		http://pen.sagepub.com/content/40/2/159.full.pdf+html
Compher C et al.	2022	Guidelines for the provision of nutrition support therapy in the adult critically ill patient: The American Society for Parenteral and Enteral Nutrition. J Parenter Enteral Nutr.2022;46:12–41.		https://aspenjournals.onlinelibrary.wiley.com/doi/epdf/10.1002/jpen.2267
P. Singer et al.	2015	Critical Care Handbook of the Massachusetts General Hospital, 6th edition, Lippincott Williams & Wilkins		
P. Singer et al.	2023	ESPEN practical and partially revised guideline: Clinical nutrition in the intensive care unit. Clinical Nutrition 42 (2023) 1671e1689		https://www.espen.org/files/ESPEN-Guidelines/ESPEN_practical_and_partially_revised_guideline_Clinical_nutrition_in_the_intensive_care_unit.pdf
M Tubaro, P Vranckx, S Price	2021	The ESC Textbook of Intensive and Acute Cardiovascular Care		Oxford University Press

		SECTION VII Acute heart failure (including cardiogenic shock)		
Blaser AR, Starkopf J, Alhazzani W.	2017	Early enteral nutrition in critically ill patients: ESICM clinical practice guidelines. Intensive Care Med (2017) 43:380–398		https://link.springer.com/article/10.1007/s00134-016-4665-0
Jean-Louis Vincent, Frederick Moore and Mitchell Fink	2017	Textbook of Critical Care		https://www.clinicalkey.com
Andrew Bersten and Jonathan Handy	2019	Oh's Intensive Care Manual		https://www.clinicalkey.com
Joseph E Parrillo and R. Phillip	2019	Critical Care Medicine: Principles of Diagnosis and Management in the Adult, Fifth Edition.		https://www.clinicalkey.com
Lee Goldman, Andrew I. Schafer	2020	Goldman-Cecil Medicine, Twenty Sixth Edition		https://www.clinicalkey.com
John A. Myburgh et al.	2013	Resuscitation Fluids	N Engl J Med 2013; 369:1243-1251	DOI:10.1056/NEJMra1208627
Andrew Baker, Richard Green	2010	Renal replacement therapy tutorial of the week 194		https://resources.wfsahq.org/atotw/renal-replacement-therapy-in-critical-care/
Olson KR, Anderson IB, Benowitz NL, Blanc PD, Clark RF, Kearney TE, Kim-Katz SY, Wu AB.	2018	Poisoning & Drug Overdose, 7e. McGraw Hill		https://accessmedicine.mhmedical.com/content.aspx?bookid=2284&sectionid=177337361
Jennifer Lee	2021	ICU Quick Drug Guide, 1st Edition		https://www.clinicalkey.com
John Toffaletti	2021	Blood Gases and Critical Care Testing, 3rd edition.		https://www.clinicalkey.com
Clifford Deutschman, Patrick Neligan	2020	Evidence-Based Practice of Critical Care, 3rd Edition.		https://www.clinicalkey.com
Spahn, D.R., Bouillon, B., Cerny, V. et al.	2019	The European guideline on management of major bleeding and coagulopathy following trauma: fifth edition. Crit Care 23, 98 (2019).		https://doi.org/10.1186/s13054-019-2347-3
Jean-Charles Preiser Margaret Herridge Elie Azoulay	2020	Lessons from the ICU		https://doi.org/10.1007/978-3-030-24250-3
Judith E. Tintinalli, O. John Ma, Donald M. Yealy, Garth D. Meckler, J. Stephan Stapczynski, David M. Cline, Stephen H. Thomas	2020	Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 9e		https://accessmedicine.mhmedical.com/book.aspx?bookID=2353#183421314