INFORMATION ABOUT THE COURSE

Anesthesiology and intensive care

1. Basic information

Field of studies field of medical and health sciences, discipline: medical sciences **Unit responsible for the field of studies** Faculty of Medicine Bydgoszcz University of Science and Technology **Level of studies** Uniform master's studies **Profile of studies** General academic **Form of studies** Full-time	**Studies cycle** …….. **Course code** 17-EMS-AIC-SP1 **Language** English **Obligatory** Yes

Prerequisites	Students must have completed courses in physiology and pharmacology, which cover the basic physiological mechanisms of the body and the effects of drugs. Students should be familiar with and able to apply basic and advanced cardiopulmonary resuscitation techniques. Students must understand basic concepts related to disease states that may require anesthetic intervention or intensive care. Prerequisites are assessed by passing introductory courses and an entrance exam (both written and oral).
Introductory courses	Physiology with elements of clinical physiology, Pharmacology with toxicology, Clinical pharmacology, Pathophysiology, First aid
Coordinator	Bartosz Kozłowski

Study period	**Form of assessment** **Form and hours of classes**	**ECTS credits**
Winter semester	Exam Lecture 15h Exercise 30h Medical simulation exercise 20h Seminar 10h	6.0

2. Learning outcomes

Code	**Description of learning outcomes**	**Learning outcomes reference**
Knowledge (student knows and understands):		
K1	The graduate knows and understands the principles of nutritional therapy and fluid therapy in various disease states.	E.W9.
K2	The graduate knows and understands the types of vascular access and their use.	E.W14.
K3	The graduate knows and understands the classification of pain (acute and chronic or nociceptive, neuropathic, and nociplastic) and its causes, pain assessment tools, and the principles of its pharmacological and non-pharmacological	E.W27.

K4	The graduate knows and understands the principles of qualification for basic surgical procedures and invasive diagnostic and therapeutic procedures, as well as the most common complications.	F.W4.
K5	The graduate knows and understands the principles of perioperative safety, patient preparation for surgery, administration of general and local anesthesia, and controlled sedation.	F.W6.
K6	The graduate knows and understands the principles of postoperative treatment with analgesic therapy and postoperative monitoring.	F.W7.
K7	The graduate knows and understands the indications and principles of intensive care.	F.W8.
K8	The graduate knows and understands the guidelines for cardiopulmonary resuscitation of newborns, children, and adults.	F.W9.
K9	The graduate knows and understands invasive pain management methods.	F.W13.
K10	The graduate knows and understands the principles of management of long-term central venous catheters.	F.W14.
K11	The graduate knows and understands conditions in which the expected life expectancy, functional status, or Patient preferences limit treatment in accordance with guidelines specific to a given disease.	F.W22.
K12	The graduate knows and understands the principles of suspecting and diagnosing brain death.	F.W23.
Abilities (student can do/perform):		
A1	The graduate is able to surgically wash their hands, put on sterile gloves, dress for surgery or a procedure requiring sterility, prepare the surgical field in accordance with the principles of asepsis, and participate in surgical procedures.	F.U1.
A2	Graduates are able to assess and treat simple wounds, including local anesthesia (superficial, infiltration), apply and remove surgical sutures, and apply and change sterile surgical dressings.	F.U3.
A3	The graduate is able to recognize the most common life-threatening conditions, including using various imaging techniques	F.U4.
A4	The graduate is able to perform basic BLS resuscitation procedures in adults, including using an automated external defibrillator, in accordance with ERC guidelines	F.U11.
A5	The graduate is able to perform advanced life support (ALS) procedures in adults in accordance with ERC guidelines	F.U12.
A6	Graduates are able to convey bad news using a selected protocol, e.g.: 1) SPIKES: S (Setting – appropriate environment), P (Perception – understanding the interlocutor's state of knowledge), I (Invitation/Information – invitation to talk / informing), K (Knowledge	F.U21.

	– conveying bad news), E (Emotions and empathy), S (Strategy and summary), 2) EMPATHY: E (Emotions), M (Setting), P (Patient's perspective), A (Appropriate language), T (Message content), I (Additional information), A (Annotation in documentation),3) ABCDE: A (Advance preparation – preparation for the conversation), B (Build therapeutic environment – establishing good contact with the family), C (Communicate well – conveying bad news, taking into account the principles of communication), D (Dealing with reactions – dealing with difficult emotions), E (Encourage and validate emotions – the right to show emotions, redirect them and respond appropriately, aiming to end the meeting) – including supporting the family in the process of the patient's dignified death and informing the family about the patient's death	
A7	The graduate is able to recognize medical problems and prioritize medical treatment	O.U1.
A8	The graduate is able to recognize life-threatening conditions that require immediate medical intervention	O.U2.
A9	Graduates are able to plan diagnostic procedures and interpret their results.	O.U3.
A10	Graduates are able to implement appropriate and safe therapeutic procedures and predict their effects.	O.U4.
A11	Graduates are able to plan their own educational activities and continuously improve their knowledge.	O.U5.
A12	Graduates are able to communicate with patients and their families in an atmosphere of trust, taking into account the needs of the patient, and to convey unfavorable information using the principles of professional communication	O.U7.
A13	Graduates are able to communicate within a team and share knowledge	O.U8.
Social skills (the student is ready to):		
S1	Graduates are ready to establish and maintain deep and respectful contact with patients, as well as to show understanding for differences in worldviews and cultures	O.K1.
S2	Graduates are ready to be guided by the well-being of patients	O.K2.
S3	Graduates are ready to respect medical confidentiality and patient rights	O.K3.
S4	Graduates are prepared to take action towards patients based on ethical principles, with an awareness of the social conditions and limitations resulting from illness.	O.K4.
S5	Graduates are prepared to recognize and acknowledge their own limitations, and to self-assess their deficits and educational needs.	O.K5.

S6	The graduate is ready to accept responsibility for decisions made in the course of professional activity, including in terms of their own safety and that of others.	O.K11.

3. Programme contents

No.	Programme contents	Form of studies	Learning outcomes covered by the programme content
1	Anesthesia and perioperative management: • Rules and conditions for performing procedures in outpatient settings. • Anesthesia for patients undergoing short-term and outpatient surgery. • Patients at high risk of perioperative complications. • Preventive and therapeutic measures aimed at reducing the risk of complications.	Lecture	K1, K2, K3, K4, K7, K9
2	Management of inflammation and pain: • SIRS syndrome, sepsis, severe sepsis, septic shock – epidemiology, diagnosis. • Therapeutic management depending on the stage of symptom development. • Acute pain – basic issues. Pathomechanisms regulating the process of acute pain impulsation. • Pharmacotherapy in acute pain.	Lecture	K1, K2, K3, K4, K5, K7, K8, K9
3	Conduction anesthesia and pharmacology of local anesthetics: • Mechanisms of action of local anesthetics. • Conduction anesthesia techniques: spinal anesthesia, epidural anesthesia, epidural anesthesia. • Risks and complications associated with the use of local anesthetics. • New methods of administering local anesthetics: e.g., soft tissue anesthesia.	Seminar	K1, K3, K4, K5, K7, K8, K9, A1, A5, A7, S1, S2, S4, S5
4	Perioperative medicine - an introduction: • The role of perioperative medicine in preparing the patient for surgery. • Operative risk assessment and perioperative care planning. • Preparing the patient for anaesthesia and surgery. • Post-operative management: monitoring the patient's condition, preventing complications.	Seminar	K1, K3, K4, K7, K8, A1, A5, A7, S2, S4, S5
5	Pharmacology of general anaesthetic drugs: • Mechanism of action of different groups of anaesthetic drugs. • Classification of anaesthetic drugs: narcotics, neuroleptics, inhalation drugs.	Seminar	K3, K4, K7, A1, A5, A7, S2, S4, S5

	• Safety of anaesthetic drugs: interactions, adverse effects, monitoring.		
6	Multiple organ failure: cardiovascular, respiratory, CNS: • Pathophysiology of multiple organ failure. • Diagnosis and assessment of severity of failure of individual systems. • Therapeutic management of cardiovascular, respiratory and CNS failure.	Seminar	K1, K2, K3, K4, K5, K7, K8, K9, A1, A5, A7, S2, S5
7	Multi-organ failure: excretory system, gastrointestinal system: • Consequences of excretory and gastrointestinal system failure for the patient before, during and after surgery. • Monitoring renal and hepatic function in patients undergoing general anaesthesia. • Prevention of complications associated with gastrointestinal and excretory failure.	Seminar	K1, K2, K3, K4, K5, K7, K8, A1, A5, A7, S2, S5
8	Construction of the anaesthetic apparatus: • Familiarisation with the construction and operation of the anaesthetic apparatus. • Practical exercises on the operation of the apparatus and its components. • Simulated emergency situations and how to handle the apparatus.	Exercise, Medical simulation exercise	K2, K3, K4, K7, K8, A3, A4, A9, S2, S4, S5, S6
9	Basics of replacement ventilation: • Demonstration of different methods of replacement ventilation. • Practical exercises in setting ventilation parameters. • Simulated life-threatening scenarios and how to respond to ventilation problems.	Exercise, Medical simulation exercise	K1, K2, K5, K6, A1, A2, A4, A10, A11, A12, S1, S2, S3, S4, S5, S6
10	Face mask ventilation and principles of intubation: • Practical exercises in face mask use and intubation. • Intubation techniques in different clinical settings. • Simulated scenarios of intubation difficulties and how to solve them.	Exercise, Medical simulation exercise	K1, K2, K5, K6, K8, A1, A2, A3, A4, A10, A11, A12, S1, S2, S3, S4, S5, S6
11	Installation of non-invasive monitoring methods during anaesthesia: • Practical skills for installing vital signs monitors. • Monitoring of blood pressure, oxygen saturation, ECG etc. • Interpretation of monitoring results and response to changes in patient vital signs.	Exercise, Medical simulation exercise	K1, K2, K3, K4, K7, K8, A1, A2, A3, A4, A6, A8, A10, S1, S2, S3, S4, S5, S6
12	Opioid analgesics: pharmacokinetics, pharmacodynamics, adverse effects: • Exercises in the calculation of opioid drug doses. • Clinical case analysis of opioid use in different situations. • Discussion of side effects and remedies.	Exercise, Medical simulation exercise	K1, K2, K4, A1, A4, A7, A10, S1, S2, S3, S4, S5, S6

13	Regional anaesthesia - methods of identifying neural structures: • Exercises in identifying neural structures on anatomical models. • Techniques of puncture and injection of anaesthetic drugs. • Discussion of complications and how to avoid them with regional anaesthesia.	Exercise, Medical simulation exercise	K1, K2, K3, K4, K7, K8, A1, A2, A3, A4, A6, A8, A9, S1, S2, S3, S4, S6
14	Non-invasive and invasive methods of post-operative pain management: • Exercises in assessing the effectiveness of different methods of postoperative pain management. • Practical aspects of the use of pharmacological and non-medical analgesia. • Recognition and treatment of complications associated with pain therapy.	Exercise, Medical simulation exercise	K1, K2, K3, K4, K7, A1, A2, A4, A9, S1, S2, S3, S4, S6
15	Passive oxygen therapy methods, non-invasive ventilation, basic positive pressure ventilation modes: • Practical skills for setting ventilation parameters. • Simulated situations of sudden patient deterioration and the need to change the ventilation mode. • Exercises in the use of ventilation equipment and monitoring the patient during ventilation.	Exercise, Medical simulation exercise	K1, K2, K3, K4, K5, K6, K9, A1, A2, A3, A4, A8, A10, A11, A12, S1, S2, S3, S4, S5, S6
16	Practical aspects of catecholamines and cardiovascular drugs therapy: • Exercises in the preparation and administration of catecholamines. • Monitoring the effects of therapy and response to changes in haemodynamic parameters. • Prevention and treatment of adverse effects of cardiotropic drugs.	Exercise, Medical simulation exercise	K1, K2, K3, K4, K5, K7, A1, A2, A3, A4, A9, A10, S1, S2, S3, S4, S5, S6
17	Principles of antibiotic therapy and nutritional treatment in the ICU: • A case study of antibiotic therapy in different clinical situations. • Exercises in selecting appropriate antibiotic therapy regimens. • Discussion of the principles of intensive care patient nutrition and nutritional treatment in different clinical conditions.	Exercise, Medical simulation exercise	K1, K2, K5, A1, A3, A4, S2, S3, S4, S6
18	Communication with the patient - 3h	Exercise, Medical simulation exercise, Seminar	A10, A6, S1

4. Methods of verifying and assessing the learning outcomes achieved by the student

Winter semester

Form of studies	
	Methods of studies form:
	Lecture

<table>
<tr><td rowspan="3">Lecture</td><td>Methods of verification:</td><td>Involvement:</td></tr>
<tr><td>Written exam</td><td>100%</td></tr>
<tr><td colspan="2">Conditions for passing the course:</td></tr>
<tr><td colspan="3">A prerequisite for passing the course is obtaining a positive grade in a written examination (test - 50 questions). The exam covers the range of topics covered in all classes of the course "Anaesthesiology and intensive care". Threshold for passing the exam: 60%. Detailed assessment criteria are available in the Academic Regulations.

A prerequisite for taking the examination is to pass the exercises, simulation exercises and seminars.</td></tr>
<tr><td rowspan="7">Exercise</td><td colspan="2">Methods of studies form:</td></tr>
<tr><td colspan="2">Discussion, Laboratory exercises, Clinical classes</td></tr>
<tr><td>Methods of verification:</td><td>Involvement:</td></tr>
<tr><td>Activity</td><td>10%</td></tr>
<tr><td>Simulations</td><td>50%</td></tr>
<tr><td>Observation</td><td>40%</td></tr>
<tr><td colspan="2">Conditions for passing the course:</td></tr>
<tr><td colspan="3">Attendance at all classes is a prerequisite for passing. Student activity and involvement will be assessed during the exercises. The pass mark for the exercise part of the course consists of the performance of a medical procedure from the field of anaesthesiology and intensive care under simulated conditions, the pass mark is 75%. Detailed conditions for passing are available in the regulations of the department.</td></tr>
<tr><td rowspan="7">Medical simulation exercise</td><td colspan="2">Methods of studies form:</td></tr>
<tr><td colspan="2">Discussion, Demonstration, Group work, Exercises in the simulation centre</td></tr>
<tr><td>Methods of verification:</td><td>Involvement:</td></tr>
<tr><td>Activity</td><td>10%</td></tr>
<tr><td>Simulations</td><td>50%</td></tr>
<tr><td>Observation</td><td>40%</td></tr>
<tr><td colspan="2">Conditions for passing the course:</td></tr>
<tr><td colspan="3">Attendance at all classes is a prerequisite for passing. Student activity and involvement will be assessed during the exercises. The pass mark for the exercise part of the course consists of the performance of a medical procedure from the field of anaesthesiology and intensive care under simulated conditions, the pass mark is 75%. Detailed conditions for passing are available in the regulations of the department.</td></tr>
<tr><td rowspan="6">Seminar</td><td colspan="2">Methods of studies form:</td></tr>
<tr><td colspan="2">Discussion, Demonstration, Group work</td></tr>
<tr><td>Methods of verification:</td><td>Involvement:</td></tr>
<tr><td>Entrance test</td><td>25%</td></tr>
<tr><td>Colloquium</td><td>75%</td></tr>
<tr><td colspan="2">Conditions for passing the course:</td></tr>
</table>

	Each seminar begins with an entrance test to check the knowledge and preparation for the class. A prerequisite for successful completion of the seminars is the passing of all entrance tests and a pass mark for the final test (single-choice, 30 questions, pass mark 60%).

Learning outcomes	**Methods of verification**					
	Written exam	Activity	Observation	Simulations	Entrance test	Colloquium
K1	X	x	X		X	X
K2	X	x	X		X	X
K3	X		X		X	X
K4	X		X		X	X
K5	X		X		X	X
K6	X		X		X	X
K7	X		X		X	X
K8	X		X		X	X
K9	X		X		X	X
K10	X		X		X	X
K11	X		X		X	X
K12	X		X		x	x
A1		X	X	X		
A2		X	X	X		
A3		X	X	X		
A4		X	X	X		
A5		X	X			
A6		X	X			
A7		X	X			
A8		X	X	X		
A9		X	X	X		
A10		X	X	X		
A11		X	X	X		
A12		X	X	X		
A13		X	X	X		
S1		X	X			

S2		X	X			
S3		X	X			
S4		X	X			
S5		X	X			
S6		X	x			

5. Student workload – balance of hours and ECTS credits

Students activity		**Student workload Number of hours**
Classes conducted with the direct participation of an academic teacher or other persons conducting classes	Lecture	15
	Exercise	30
	Medical simulation exercise	20
	Seminar	10
Student's own work	Preparing for classes	15
	Preparing a presentation	12
	Studying literature	15
	Preparing for a test	13
	Preparing for an exam	20
Total student workload		150
ECTS		6

One (teaching) hour is 45 minutes.

6. Literature

The list of required and recommended literature will be provided by the lecturer at the first meeting.