Jordan University of Science and Technology
Department of Anaesthesia

COURSE TITLE	**:**	**Anaesthesia**
COURSE CODE	**:**	**MED 418**
CREDIT HOURS	**:**	**2.25 credit hours**
SEQUANCE	**:**	**YEAR 4 / 2 WEEKS**
COURS COORDINATOR:		**Dr. Diab Bani Hani ; Dr. Adel Batineh**
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منسق المساق رئيس قسم التخدير وألإنعاش د. ذياب بني هاني 0798661232

Course Describtion:

This 2-week course is offered to the fifth year medical students. During this clinical rotation students will spend their morning hours in the operating theater learning basic principles of anesthesia including airway management, fluid management, induction and maintenance of anesthesia, patient's monitoring, pain managment and recovery. Students will be given daily seminars that cover important aspects of anesthesia. Each of the course topics is incorporated into an integrated system of lectures covering anesthesia related -anatomy, physiology, physics, pharmacology, pathology. Also, Clinical implications for these information will be addressed by specialists in the department. These subjects will be addressed by Clinical anesthetists. Goals of this course will be achieved via lectures, seminars or small group discussions, and clinical attendance in the operating theaters.

More specifically, pre-operative preparation of the surgical patients will be covered at first to provide basic knowledge and understanding of the conduct of anesthesia, as well as the implementation of patient's co-morbidities on the process of anesthesia. Fundamental principles of pharmacology will be explained to extend the knowledge of students towards the drugs used in anesthesia, and their effects on the diverse pathological states of the patients. Afterward, the anatomy and physiology of the airway will be discussed thoroughly in preparation for the clinical airway management section.
The different modes of monitoring patients will be discussed including standard and invasive ways and how they are tailored to the patients. The physiology of bodily fluids is discussed to pave the way into both intraoperative IV fluids management and blood transfusion.
A separate session will be appointed to discuss neuro-axial anesthesia, and it's use as a cornerstone in anesthesia

During the course and whenever relevant the students are exposed to clinical scenario problems to emphasize the explanations of symptoms, signs, investigations and forms of management. Practical sessions are planned through operating theaters attendance to allow the students to express their knowledge and confirm concepts learned in lectures and learn clinical skills related to the practice of anesthesia.

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Course Learning Outcomes

General objectives:

Academic:

1. To demonstrate an understanding of the anesthetic considerations for a variety of medical conditions and perform the appropriate/necessary preoperative assessment/preparation of the patient.
2. To acquire the knowledge necessary to conduct appropriate fluid and blood component therapy
3. To recognize and describe the main drug classes frequently used in the perioperative period
4. To review and describe the principles of pain management
5. To acquire basic skills in airway management

Clinical:

1. Airway management skills
2. Mask ventilation and tracheal intubation,
3. securing intravenous access
4. Preoperative assessment of the Airways.
5. The appropriate use of local anaesthetic Agents

Program of teaching undergraduate fifth year medical students during the rotation in Anaesthesia and operating theatres.

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Lectures:

1-	**Pre-operative evaluation and assessment**	Describe current evidence base guidelines in the management and assessment of perioperative patients

1. To demonstrate an understanding of the anesthetic considerations for a variety of medical conditions and perform the appropriate/necessary preoperative assessment/preparation of the patient.
By the end of the rotation, , the student will be able to:
A) Obtain and record a pertinent medical history
B) Perform a focused physical examination including assessment of the airway, the respiratory and cardiovascular systems, and other systems as indicated by the clinical situation
C) Interpret basic laboratory data and investigations relevant to the preoperative assessment
D) Develop a problem list and assigning appropriate ASA physical status based on their patient assessment
E) Recommend appropriate pre-medication (e.g. anxiolytic, aspiration prophylaxis) and recognize which medications to hold preoperatively (e.g. anticoagulants, oral hypoglycemics)
F) State the recommended preoperative fasting guidelines, list the risk factors for perioperative aspiration and describe strategies to reduce this risk.

2-	**Inhalational agents**	MAC and factors which alter MAC. Factors determining how quickly the inhalational agent reach MAC. MAC Value of N2O, Halothane, Isoflurane, Sevoflurane

Nitrous Oxide(N2O):

- physical properties
- The second gas effect
- Diffusion hypoxia
- Effect on closed gas spaces

Halothane, Isoflurane, Sevoflurane

- **Physical properties**
- **MAC values**
- **Effects of different organ systems.**

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2-	IV agents	

To recognize and describe the main drug classes frequently used in the perioperative period.

A) By the end of the rotation, the student will be able to describe the main therapeutic effects, side effects and contraindications of the following classes of medications

The main examples of medications .

a. Benzodiazepines (midazolam, lorazepam)
b. Opioids (fentanyl, morphine)
c. Induction agents (propofol)
d. Local anesthetics (lidocaine, bupivicanie)
e. Muscle relaxants (succinylcholine, rocuronium)
f. NSAIDS (ibuprofen, naproxen, celecoxib)
g. Antiemetics
h. Anticholinergic drugs:(mainlyAtropine) * Effect on the different organ systems
i. Cholinesterase inhibitors: (mainly Neostigmin) and their effect on the different organ systems

B) The student will be able to differentiate the 2 classes of local anesthetics

C) The student will be able to recognize the signs and symptoms of local anesthetic toxicity and outline the initial management.

3-	**Monitoring**	Guidelines to the practice of anaesthesia and patient Monitoring

- Moniting : ECG, Pulse-oximetry, Blood pressure , CVP, Capnography EtCO2
- . the normal values of monitored parameters for a healthy adult
- O2- Hb-dissociation curve

4-	**CPR**	**According to AHA guidelines.**

1- The definition of sudden cardiac arrest
2- the indication for CPR
3- the algorithm used in BLS
4- the pharmacology used in CPR
5- the indicators of a successful CPR
6- management of ROSC(return of spontaneous circulation).

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5-	**Intubation and Anatomy of the Airway And Anesthesia apparatus**	To acquire basic skills in airway management

A) Label the basic structures of the oropharyngeal and laryngo-tracheal anatomy
B) State the indications and complications of airway management by face mask, laryngeal mask and intubation
C) Identify the appropriate size of face masks, laryngeal masks, oral and nasal airways, laryngoscope blades, and endotracheal tubes
D) Recognize upper airway obstruction and independently demonstrate appropriate use of face mask, oral and nasal airways, head positioning, jaw thrust and chin lift maneuvers
E) demonstrate bag-mask ventilation of an unconscious patient

6-	Blood transfusion and IV fluids	

A) Recognize and describe the physiologic bodily components of fluid
B) Assess a patient's volume status using history, physical examination and laboratory investigations
C) Insert a peripheral intravenous catheter .
D) Demonstrate an understanding of the composition of commonly available intravenous fluids by selecting appropriate perioperative fluid and electrolyte replacement while taking into account the patient's deficits, maintenance requirements, and ongoing losses.
E) State the indications and complications of the various blood products (PRBC's, FFP, platelets) and describe the factors influencing one's decision/threshold to administer blood product therapy.

7-	Neuro-axial anesthesia	

1-Procedure including Anatomy,
2-Indications and contraindications
3-Complications (Prevention and Treatment)

8-	Pain management	

To review and describe the principles of pain management
: A) Explain the concept of multimodal analgesia
B) Identify and describe a variety of modalities commonly used for pain control. Examples of these are: patient controlled analgesia (IV PCA), intrathecal (spinal) opioids, epidural infusions and peripheral nerve blockade.

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Recommended Textbooks and Atlases:

1- Miller's anesthesia
2- Clinical anesthesia by morgan and mikhail's
3- Toronto notes (anesthesia chapter).

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Assessment		
Assessment Type	**Expected Due Date**	**Weight**
First Exam		**--**
Second Exam		**--**
Midterm Exam (Theory)		**40**
Evaluation		**15**
Quizzes		**--**
Research activity		**--**
OSCE		**--**
Mini-OSCE		**--**
Final Exam (Practical)		**45**
Final Exam(Oral)		**--**
Total		**100**

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Students Learning Outcomes

Student Learning Outcomes(SLOs) (4-8 Maximum) Upon successful completion of this course, students should be able to:			
SLOs	**Related ILO(s)* (numbers only)**	**Evaluation Criteria (MCQ, OSCE, Homework…)**	
		Type of Criteria (MCQ, OSCE, Homework…)	**Weight (%)**
Describe the anatomical and physiological basis for the airways related to the practice of anesthesia **1. Airway management skills** **2. Mask ventilation and tracheal intubation,**	**1,3,6,8**	**MCQ**	**10**
Describe the pharmacologic principles in anesthesia practice	**2,9**	**MCQ**	**35**
Able to explain the monitoring process of patients under anesthesia.	**5,7,8**	**MCQ**	**5**
understand the process of CPR and the guidelines for it.	**2,3,5,9**	**MCQ**	**15**
Describe current evidence base guidelines in the management and assessment of perioperative patients	**2,3,4,6,7,8**	**MCQ**	**10**
Evaluate and guide fluid management and blood transfusion in anesthesia	**1,2,5,9**	**MCQ**	**10**
Bsic understanding of neuro-axial anesthesia	**1,9**	**MCQ**	**10**
Pain management	**1,9**	**MCQ**	**5**
			100

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Intended Learning Outcomes (ILOs)

1) Demonstrate a sufficient understanding of the structural organization and functions of the following systems of the human body: circulatory, respiratory, gastrointestinal, endocrine, hematopoietic & lymphatic, musculoskeletal, nervous, and genitourinary systems.
2) Conceptualize the cellular, molecular, genetic, and biochemical mechanisms that maintain body's homeostasis and their derangements in disease states.
3) Apply their knowledge of human anatomy and function to solve questions regarding major clinical cases and diseases.
4) Attain appropriate and systematic clinical history of different medical conditions and settings.
5) Demonstrate proficiency in performing clinical skills and procedures.
6) Perform relevant physical examination on patients professionally and ethically.
7) Identify the major signs and symptoms of disease states, recognizing risk factors and etiologies, in an interdisciplinary approach to differentially diagnose patients.
8) Order and interpret results of relevant basic diagnostic procedures, such as laboratory investigations and conventional imaging procedures.
9) Apply safe and accurate methods of pharmacotherapy of major disease states.
10) Critically appraise research studies guided by evidence-based medicine.
11) Demonstrate ability to work in diverse settings and communities.

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