COURSE PLAN

FIRST: BASIC INFORMATION

College

College	: Medicine
Department	: Surgery / Anesthesia and Critical care

Course

Course Title	: Anesthesia and Critical Care
Course Code	: 31511401
Credit Hours	: 3 hours / 3 weeks
Prerequisite	: Successfully passing the 3rd year

Instructor

Name	: Dr. Mohammad Alsawalmeh
Office No.	: 9
Tel (Ext)	: 00962797554299
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Office Hours	: 2-3 pm

Class Times

Building	Day	Start Time	End Time	Room No.
Lectures rooms at the faculty building	According to the timetable.	8:30	14:00	According to the timetable
Ministry of Health Hospitals ORs.	According to the timetable.	8:30	14:00	According to the timetable
. Royal Medical Services Hospitals ORs.	According to the timetable	8:30	14:00	According to the timetable

Text Book

- Textbook of Anaesthesia: Aitkenhead et al.
- Clinical Anesthesiology: G. Edward Morgani jr et al.
- Toronto Notes: Anesthesia and Perioperative Medicine chapter.

References

- Pubmed.com website.
- UpToDate database.

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

The Anesthesia Course for undergraduate medical students at Al-Balqa Applied University is a three weeks Course in the department of surgery and special surgery / Anesthesia and Critical care division. It is a separate Minor course for medical students with a 3 credit hours weight. Students join this course in their Fourth undergraduate year. In the first week, students are given lectures in the faculty's lectures rooms. In the next two weeks, students will be weekly assigned to an operating rooms at Ministry of Health hospitals and Royal Medical Service hospitals with the concept that each student will go through different surgical specialties and be familiarized with the different anesthetic care plans. There are 13 seminars that cover the most important topics in anesthesia relevant to undergraduate medical students. During the in-theatre time, student will be introduced to the practice of Anesthesia, familiarized with anesthesia machine, Equipments, drugs, and procedures. Each Operating theatre is covered by an anesthesia team consisting of a consultant anesthetist, an anesthesia resident doctor, and an anesthesia technician.

COURSE OBJECTIVES

This course is aimed to:

1- The medical graduate will be educated about technical aspects of Anesthesia.
2- The medical graduate will be aware of the role of Anesthesia as a perioperative medical care specialty.
3- The medical graduate will be aware of how anesthesia relates to other specialties in the multidisciplinary care plan of patients.
4- The medical graduate will be fit enough to deal confidently with cardiopulmonary resuscitation scenarios.

COURSE LEARNING OUTCOMES

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding: Student is expected to:

1. Recognize the necessary medical information that relates to the conduct of Anesthesia.
2. Understand how the specialty of anesthesia relates to other medical specialties and the necessity and ways of good communication with them.
3. Be aware of different types of anesthesia available, and their case-matching.
4. Be aware of the pharmacologic knowledge of drugs used during anesthesia.
5. Understand the structure, function, and multidisciplinary role of Intensive care unit.
6. Understand the basic scientific concepts underlying airway management and cardiopulmonary resuscitation.
7. Understand the basic concepts and aspects of intravascular access insertion.

B. Intellectual Analytical and Cognitive Skills: Student is expected to:

1. Be able to integrate his knowledge from patient assessment and anesthetic drugs and procedures for the best safe match of care and creation of a management plan.
2. Be able to provide counselling to patients regarding their anesthetic care.
3. Be able to communicate with other specialties involved in the total care of patients.
4. Be able to apply, read and analyze data from monitoring equipment.
5. Be able to assume leadership role during cardiopulmonary resuscitation.

C. Subject- Specific Skills: Students is expected to:

1. Have acquired adequate competency in securing vascular access.
2. Have acquired competency in safe drug preparation and administration.
3. Have acquired adequate competency of airway management skills.
4. Have acquired adequate competency in cardiopulmonary resuscitation skills.

D. Transferable Key Skills: Students is expected to:

1. Be a good and efficient team member.
2. Be able to assume leadership roles in critical medical conditions.
3. Be able to prioritize management issues in their plan.
4. Be good at verbal and written communication about patients.
5. Be able to deal with technology of monitoring equipment

COURSE SYLLABUS

Day of seminar	Seminar topics
First day	Introduction and preoperative evaluation Intravenous anesthetic agents Inhalational agents
Second day	Muscle relaxants and reversal Intubation and airway anatomy
Third day	Conduct of anesthesia Monitoring in anesthesia
Fourth day	Local anesthetic agents Regional anesthesia and Beir's block Pain management
Fifth day	Intravenous fluids Blood transfusion BLS and ACLS

Each seminar should cover the following points:

1. **Introduction and preoperative evaluation**
   (prepared and discussed by course director)

- Anesthesia definition
- How to take full anesthesia history and physical examination

- How to prepare patient for operations in general
- Risk assessment and premedication

2. Intravenous anesthetic agents

- Barbiturate (Thiopentone)
  - Physical, chemical properties and presentation
  - Pharmacokinetics
  - Pharmacodynamics
  - Dosage and administration
  - Indications and contraindications
  - Adverse effects (extravascular, intraarterial, Allergy)

- Non- barbiturate (Propofol, Ketamine)
  - Physical, chemical properties and presentation
  - Pharmacokinetics
  - Pharmacodynamics
  - Dosage and administration
  - Indications and contraindications
- Other adjuvant intravenous anesthetic agents:
  - Benzodiazepines (midazolam and Diazepam)
  - Narcotic Agonists and Antagonists: definition, site of action, effect on organ systems, Fentanyl and Morphine.
  - Narcotic Antagonist: Naloxone.

3. Inhalational anesthetic agents

- MAC and factors affect MAC
- Factors affecting how quickly the inhalational agent reaches the alveoli.
- Factors affecting how quickly the inhalational agent reaches the brain from alveoli to get effect.
- MAC value of N2O, Halothane, Isoflurane, Sevoflurane.
- N2O:
  - Physical properties
  - MAC value of N2O
  - The second gas effect
  - Diffusion hypoxia
  - Effect on closed gas spaces
- Halothane, Isoflurane, Sevoflurane:
  - Physical properties

- MAC value
- Effect on different systems
- Side effects
- Indications and contraindications

- Enflurane, Desflurane only MAC value.

4. Muscle relaxants

- Physiology of neuromuscular transmission
- Depolarizing muscle relaxants:
  - Suxamethonium:
    Structure and mechanism of action

    Dose and duration of action

    Indications and contraindications

    Side effects of Suxamethonium

    Factors affecting duration of Suxamethonium

- Non-Depolarizing muscle relaxants
  - Mechanism of action
  - Factors affecting duration of Non- Depolarizing muscle relaxants
  - Atracurium and Cis-Atracurium
  - Rocuronium bromide
  - Pancuronium bromide
  - Vecuronium bromide
- Anticholinergic drugs (mainly Atropine)
  - Effect on different organ systems (cardiovascular, Salivary glands, smooth muscles, and pupils).
  - Dose.
  - Scopolamine and Glycopyrrolate: differences from Atropine
- Cholinesterase inhibitors (mainly Neostigmin)
  - Mechanism of action
  - Effect on the different organ systems (cardiovascular, Salivary glands, smooth muscles, and pupils).
  - Dose
  - The role of Atropine and Neostigmine in Anesthesia

5. Intubation and airway anatomy

- Assessment of patient's airway including 1-2-3 test
- Different classifications of airway structures
- The technique of tracheal intubation (steps in detail)
- The anatomical structures seen in region of intubation
- Laryngoscopes and type of blades
- Tracheal tubes: size and type of blades, shape of tubes, and specialized tubes
- The laryngeal mask
- The nasopharyngeal airway
- The oropharyngeal airway

6. Conduct of anesthesia

- Inhalational induction:
  - Procedure
  - Indications
  - Difficulties and complications
- Maintenance of anesthesia
  - Conduct of inhalational anesthetics with spontaneous ventilation
  - Difficulties and complications
  - Airway maintenance during delivery of inhalational agents (face mask, laryngeal mask, Tracheal intubation)
- Anesthesia for tracheal intubation:
  - Inhalational technique for intubation
  - Relaxant anesthesia indications
- Conduct of extubation
  - Procedure
  - Complications

7. Monitoring in Anesthesia

- Anesthesia depth
- Guidelines to practice of anesthesia on patients
- How to monitor the Oxygenation, ventilation, circulation, and temperature during anesthesia
- Monitoring (ECG, Pulse oximetry, Blood pressure, CVP, capnography EtCo2)
- Cyanosis definition
- O2- Hb dissociation curve
- Normal monitoring values for healthy adult under general anesthesia

8. Local anesthetic agents

- Pharmacology of local anesthetic agents:
  - Definition
  - Classification
  - Comparison between two classes
  - Mode of action
- Preparation of local anesthetic agent
- Addition of vasoconstrictors
  - Indications and contraindications
  - How to prepare Adrenaline 1:200000
- Clinical uses of local anesthetic agents
- Lidocaine
- Toxicity (causes, prevention, and treatment)

9. Regional anesthesia

- Spinal and epidural anesthesia:
  - Procedure
  - Indications and contraindications
  - Complications (prevention and treatment)
- Bier's block
  - Procedure
  - Indications and contraindications
  - Complications (prevention and treatment)

10. Intravenous fluids

- Distribution of body fluids compartments
- Normal values in extracellular space (serum)
- Normal maintenance needs
  - Water
  - Sodium
  - Potassium
- Fluid replacement solutions:
  - Crystalloid solutions (type, content, indications)
  - Colloid solutions (type, contents, indications)
  - Intraoperative fluid requirements

11. Blood transfusion:

- ABO-Rh typing
- Storage and preservation of blood and derivatives

- Complications of blood transfusion
- Massive blood trans fusion and management

12. Pain management:

- What is pain
- Pain score
- Pain types and its definition
- Pathophysiology of pain
- Gate control theory
  - Pharmacological treatment of pain
  - Opioids (morphine, codeine, pethidine, fentanyl, tramadol).
  - non-opioids (paracetamol, NSAIDs (diclofenac sodium and ketorolac)
  - adjuvants
- choice of drugs in treatment of acute and chronic pain (3 step analgesic ladder)

13. BLS and ACLS

(presented by course director)

- How to deal with unresponsive patient according to the latest guidelines

COURSE LEARNING RESOURCES

- Textbook of Anaesthesia: Aitkenhead et al.
- Clinical Anesthesiology: G. Edward Morgani jr et al.
- Toronto Notes: Anesthesia and Perioperative Medicine chapter.
- Pubmed.com website.
- UpToDate database.
- Seminars and Elearning

ASSESSMANT TOOLS

(Write assessment tools that will be used to test students ability to understand the course material and gain the skills and competencies stated in learning outcomes

ASSESSMENT TOOLS	%
Participation	5
Homework and quizzes	10
Mid Exam: as below	
1. Mini-OSCE	15
2. Long Cases	20
Final Exam	50
TOTAL MARKS	100

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

GRADING SYSTEM

Points	Grade
	A
	A-
	B+
	B
	B-
	C+
	C
	C-
	D+
	D
	D-
	F

REMARKS

- Health and safety procedures: As per hospital policies and requirements: immunizations, scrubs, etc
- Honesty policy regarding cheating, plagiarism, misbehavior: Those captured will be withdrawn from exam and referred to faculty's relevant disciplinary committee.

COURSE COORDINATOR

Course Coordinator: Dr. Mohammad Alsawalmeh	**Department Head: Dr. Waleed Haddad**
Signature:	**Signature:**
Date: 5/7/2020	**Date:**