

Course Book

Course Description	<p>Blood Bank technology is a course detailing on blood banking process. blood groups, blood transfusion complications, collection and storage of blood and components, general administration, personnel administration, and automated data processing are all topics that blood bank specialists are well-versed in the field. Course in Blood bank technology makes the students specialized to work in various settings, including private hospital blood banks, community blood banks, transfusion services, university-affiliated blood banks, and independent laboratories, among others.</p> <p>Blood bank technology professionals perform all blood bank operations, from simple testing to the most complex procedures. Specialists in blood banking technology operate in blood donation centers, transfusion services, reference laboratories, and research institutions. Instead of performing routine blood tests, blood bank technology professionals are trained to perform specialty tests such as immunohematology. Transplant or transfusion therapy frequently requires the assistance of a blood bank professional.</p> <p>As phlebotomists, blood bank workers receive professional training. They are educated to work with a variety of patients in various situations, such as collecting and identifying blood types in patients. Under the supervision of clinical laboratory technologists, they also analyses the obtained blood and collect blood for the blood center.</p>
Course objectives	<p>After the students complete this course, they gain knowledge and can work on multiple things like:</p> <p>Antigen testing, compatibility testing, and antibody identification</p> <p>Students are trained in investigating abnormalities such as hemolytic anemias, and transfusion responses.</p> <p>Candidates support physicians with transfusion therapy for patients with (blood clotting disorders) coagulopathies.</p> <p>Selecting donors, collecting blood, typing blood, and molecular testing are all part of the blood collection and processing process.</p> <p>They guarantee patient safety; viral marker testing is performed.</p>

	<p>Blood is tested for viruses that could be spread during a blood transfusion.</p> <p>Investigating the body's adverse reactions to blood transfusions</p> <p>Supervising blood component collection, separation, delivery, and storage.</p>
<p>Student's obligation</p>	<p>We have theory 1 hours ,practical 2 hours</p> <p>General advice:</p> <p>1-keep up with material.it is essential that you study the material within a reasonable period of time after lecture/lab.</p> <p>2-Ask question. regardless of whether you are in lecture or lab, it is essential that you ask question if you don't understand a concept.</p> <p>3-Read the book. Make sure you read the appropriate chapter (s) before my lecture on a given topic .the description, tables, figure and diagram of concepts in the book will be most helpful in helping you learn the material.</p> <p>You have got 2 hours for lab.....use your time wisely . Although not every lab session will go with full 2 hours .it is wise use the remaining time to do brush up on material that was covered during previous labs. Lab exams will cover a lot of material, so it is important that you fully utilize lab time whenever available to you.</p>
<p>Required Learning Materials</p>	<ul style="list-style-type: none"> • The lectures will be available online in the Moodle. • lecture halls with data show equipment for lecture presentations, white board, overhead projector, posters

Evaluation	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
	Paper Review				
	Assignments	Homework	14%		
		Class Activity	2%		
		Report	24%		
		Seminar			
		Essay			
		Project			
	Quiz		4%		
	Lab.				
	Midterm Exam		16%		
	Final Exam		40%		
Total		100%			
General learning outcome:	<p>Upon completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> • Demonstrate competency in investigating, evaluating, and interpreting Blood banking cases. This includes selecting appropriate blood products for transfusion and work-ups of positive antibody screens and panels and transfusion reactions. • Demonstrate professional behavior regarding patients, other physicians and all clinical laboratory personnel. • Demonstrate a commitment to reviewing and improving Blood Bank practice patterns and to life-long learning. • Understand the scientific basis and pathophysiology of Blood Banking, which includes an understanding of immunohematology. • Recognize the importance of utilizing the medical literature and modern techniques to provide optimal patient care. 				
Specific learning outcome:	<p>Upon successful completion of this course, students will:</p> <ul style="list-style-type: none"> • Demonstrate knowledge of the principles of patient/unit identification and pre-transfusion testing, including ABO/RhD testing, RBC antibody screen, and antibody identification. • Recognize the symptoms and signs of hemolytic and nonhemolytic transfusion reactions and demonstrate 				

	<p>knowledge of the pathophysiology, treatment, and prevention of these complications.</p> <ul style="list-style-type: none"> • Identify the major infectious complications of blood transfusions and the current risk of these infections, and explain how these infections can be prevented. • Identify the major noninfectious complications of blood transfusions, including transfusion-related acute lung injury, the risk of these complications, and strategies to prevent them. • Choose appropriate blood components and derivatives based on a thorough knowledge of the indications for transfusion. • Demonstrate knowledge of the pathophysiology, prevention, and treatment of hemolytic disease of the newborn. Recognize those antibodies in pregnant patients that are clinically significant and make appropriate recommendations for blood products. • Apply the principles of a massive transfusion protocol. • Demonstrate a working knowledge of the principles of hemostasis and coagulation and proficiency in the initial treatment of patients with bleeding disorders. • Demonstrate knowledge of the transfusion requirements of special patient populations (e.g., hematology/oncology, pediatrics, geriatrics, transplantation, and burn/trauma). • Demonstrate proficiency in evaluating and presenting findings from recent peer-reviewed journal articles related to transfusion medicine. • Compare and contrast the eligibility requirements for allogeneic and autologous blood donations. • Summarize the steps in blood component and blood derivative preparation.
<p>Course References:</p>	<ul style="list-style-type: none"> • Textbook of Blood Banking and Transfusion Medicine Hardcover – 18 February 2005 • Blood Banking and Transfusion Medicine Basic Principles and Practice 2nd Edition - October 18, 2006 Authors: Christopher Hillyer, Leslie Silberstein, Paul Ness, Kenneth Anderson, John Roback eBook ISBN: 9780702036255 • Handbook of Blood Banking & Transfusion Medicine by Gundu HR Rao, Ted Eastlund, Latha Jagannathan

Course topics (Theory)	Week	Learning Outcome
Introduction of Blood bank Donors and It's types – Criteria of Donor – History of Donor	1	
ABO, Rh and blood group	2	
Blood collection in Blood bank – Blood donor and collection – Anticoagulant is used in blood bank	3	
Storage of blood component	4	
Physical and Biochemical changes of Storage Blood	5	
PROBLEMS AND MANagements IN BLOOD BANK:- – Auto antibodies – HLA system – Quality assurance – Quality assurance	6	
Apheresis (Separation)	7	
Donor Selection for apheresis:- 1, Donor for Plasmapheresis 2, Donor for Platelets pheresis 3, Donor for Granulopheresis 4, Donor for Lucopheresis 5, Donor for Neocytapheresis 6, Adverse effects of Apharesis in Donors	8	
Plasma exchange:- – Application of Plasma excgange – Replacement fluid for Plasma exchange – Indicalion of Plasma exchange – Complication are in Plasma exchange	9	
Preparation of PPS (Plasma Protein Solution):- 1, Albumin preparation Storage Indicalion Dose Adverse effect 2, Plasma substitute Dose	10	
Transfusion Practice in Clinical Medicine:- – Hemorrhage and Surgery – Autologus Transfusion – Advantages	11	
Types of Autologus Transfusion – Pre operative/ Pre deposit – Acute isovolumic hem dilution – Intraoperative blood salvage	12	
Tranfusion in Various Way	13	
Stem Cells – Introduction – Types of Stem , cell – Growth of Stem cells – How Stem cells are Grow – Different between Embryonic stem cell and Adult stem cell	14	

Practical Topics	Week	Learning Outcome
ABO BLOOD GROUP SYSTEM (ABO Antigens, H Genes and H Antigens) Bombay Blood Group	1	
ABO Grouping Technique Slide or Tile Technique, procedure, interpretation, advantages.	2	
ABO Grouping Technique Tube Technique	3	
ABO Grouping Technique Microplate Method, procedure, interpretation, advantages.	4	
ABO Grouping Technique Microtyping System (Gel Card), procedure, interpretation, advantages.	5	
Rh BLOOD GROUP SYSTEM Rh Antigen, Rh Antibodies	6	
Rh (D) Typing Techniques Slide or Tile Techniques	7	
Rh (D) Typing Techniques Tube Techniques	8	
Direct (Coombs) antiglobulin test (DAT), procedure, interpretation	9	
Indirect (Coombs) antiglobulin test (IAT) , procedure, interpretation	10	
Antiglobulin Test Gel Card Method	11	
BLOOD TRANSFUSION Compatibility Testing (Pretransfusion Testing)	12	
BLOOD COMPONENTS separation	13	
Transfusion reaction	14	

Questions Example Design

1- *Compositional:*

1. What are the main purposes of the cross-match?
2. What are the types of blood bags? Explain its uses.
3. Enumerate 5 conditions not allowed for blood donation permanently.
4. What are the percentages of each blood group in the population?

2- *Fill in the blanks:*

1. 4. Platelets can be stored at 22 °C for up to
 - 1 day - 1
 - week - 1
 - month - 1 year
2. 5. When RH- mother's and RH+ baby's bloods mix, the will be in risk
 - First baby -
 - Mother - Second
 - baby - None
3. 6. The disorder in the fetus due to Rh D incompatibility is known as
4. Coagulation factors are produced by and circulate in an inactive form until the coagulation cascade is initiated.

4- Find the blood group of following: (✓ for Agglutination) (X for Non-Agglutination)

1. Forward method

2. Forward method

3. Reverse method

4. Reverse method

Q1/ Select the correct answer for the following multiple choice: (Marks)

1. Most important group for transfusion and transplantation is _____
a. Rh system b. Lutheran system c. ABO system d. Colton system
2. When do antibodies start to form after birth?
a. 3 – 7 months b. 4 – 6 months c. 1 – 3 months d. 2 – 5 months
3. ABO system discovered by _____
a. Don Metcalf b. William Hewson
c. Antonie Van Leewenhoek's d. Karl Landsteiner
4. The _____ antigen is the most immunogenic of all antigens.
a. D b. C c. E d. e

Q2/ Write the steps for the procedure of the following tests (Answer only two). (Marks)

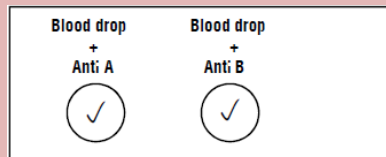
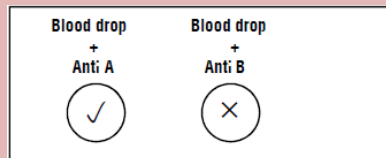
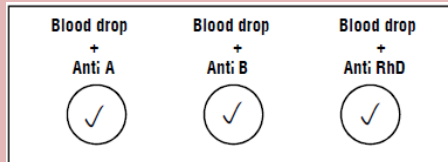
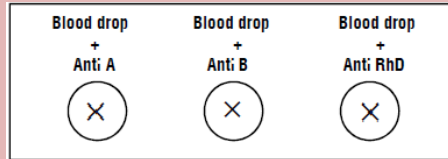
1. ABO blood grouping (Tube technique).
2. Direct antiglobulin test.

Q3/ give the reason of: (Marks)

1. In Bombay blood group, the basic precursor substance cannot be converted into H substance.

Using of O Rh positive RBCs in Indirect Antiglobulin Test

Extra notes:



WEEKLY LESSON PLANNER SEMESTER -8- (2022 - 2023)

Date/Time	8:30 - 9:30	9:30 - 10:30	10:30 - 11:30	11:30 - 12:30	12:30 - 1:30	1:30 - 2:30
Sunday	Blood Bank پ.ی.د. توانا احمد مصطفی	Clinical Immunology پ.ی.د. نجاة جبار احمد أومر		Pharmacology or Toxicology د. بؤتان عبدالقادر صالح		
Monday	Diagnostic Microbiology پ.ی.د. سازان موفق عبدالعزيز		Organization and Management of lab م. علی زینل عمر			
Tuesday	Diagnostic Microbiology (B) پ.ی.د. سازان موفق عبدالعزيز م. هه تاو جلال طاهر بکر عباس بهرام یونس سهردهشت حمه سعید حمه علی		Diagnostic Microbiology (C) پ.ی.د. سازان موفق عبدالعزيز م. هه تاو جلال طاهر بکر عباس بهرام یونس سهردهشت حمه سعید حمه علی		Diagnostic Microbiology (A) پ.ی.د. سازان موفق عبدالعزيز م. هه تاو جلال طاهر بکر عباس بهرام یونس سهردهشت حمه سعید حمه علی	
Wednesday	Clinical Immunology (A) پ.ی.د. نجاة جبار احمد أومر م. زید نبیل ایلیا فتوحی کاوه عولا حمد مهدی احمد خضر		Clinical Immunology (B) پ.ی.د. نجاة جبار احمد أومر م. فہرہنگ علی عہولا کاوه عولا حمد مهدی احمد خضر		Clinical Immunology (C) پ.ی.د. نجاة جبار احمد أومر م. علی زینل عمر کاوه عولا حمد مهدی احمد خضر	
Wednesday	Blood Bank (B) پ.ی.د. توانا احمد مصطفی معروف م. سارا ابراہیم عثمان عمر م. ہیرو عمر حمد کاکوک دارا عبدالکریم عمر هه وائل جمال رشید		Blood Bank (C) پ.ی.د. توانا احمد مصطفی معروف م. سارا ابراہیم عثمان عمر م. ہیرو عمر حمد کاکوک دارا عبدالکریم عمر هه وائل جمال رشید		Blood Bank (A) پ.ی.د. توانا احمد مصطفی معروف م. سارا ابراہیم عثمان عمر م. ہیرو عمر حمد کاکوک دارا عبدالکریم عمر هه وائل جمال رشید	
Thursday	Graduation Project					