



Department of -----Health Environmental Science

College of ----- Science

University of ----- Salahaddin

Subject: ----- Haematology.

Course Book ----- (4th Year)

Lecturer's name----- (Assist. Prof. Sarbaz I. Mohammed, PhD)

Academic Year: ----- 2022/2023

Course Book

1. Course name	Haematology
2. Lecturer in charge	Dr. Sarbaz I. Mohammad
3. Department/ College	Health Environmental Science /Science
4. Contact	e-mail: sarbaz.mohammed@su.edu.krd. Tel: (+9647504545386)
5. Time (in hours) per week	Theory: 2hr/week Practical: 6hr/week
6. Office hours	To be Return to the schedule on the office door
7. Course code	
8. Teacher's academic profile	<p>1- Assistan prof. Dr. Sarbaz I. Mohammad</p> <ul style="list-style-type: none"> I graduate from Salahaddin University in 1987(Ranked 4th in department). In 1997 I finished my MSc degree and start as Assistant Lecturer Teaching Practical animal physiology, Practical hematology, Practical parasitology, practical cell biology and Practical Invertebrate Biology. For 8 years I worked as a Member of the Examination Committee for College of Science. <p>In 2007 I get my PhD degree in hematology and from that time, as a Lecturer, I am in charge in teaching comparative theory for 4th class students, Supervising MSc and diploma student, Teaching Advanced hematology and endocrinology for Graduate student. I am head of Kurdistan natural history museum from 2008</p>
9. Keywords	Haematology
10. Course overview:	<p>In this section the lecturer shall write an overview about the subject he/she is giving. The course overview must cover:</p> <ul style="list-style-type: none"> The importance of studying the subject Understanding of the fundamental concepts of the course Principles and theories of the course A sound knowledge of the major areas of the subject Sufficient knowledge and understanding to secure employment <p>This should not be less than 200 words</p>

11. Course objective:

- **The goal of the clinical hematology is to facilitate mastery of the principles and practice of hematology needed by medical laboratory technician and medical laboratory science students to achieve board certification or licensure upon graduation. Clinical hematology has been classroom and laboratory (field tested) medical laboratory technician and medical laboratory technology**

12. Student's obligation

Classroom polices:

1- Attendance: You are strongly encouraged to attend class on a regular basis, as participation is important to your understanding of the material. This is your opportunity to ask questions. **You are responsible for obtaining any information you miss due to absence**

2- Lateness: Lateness to class is disruptive

3-Talking: During class please refrain from side conversations. These can be disruptive to your fellow students and your professor

13. Forms of teaching

Course Book, white board and PowerPoint

14. Assessment scheme

Breakdown of overall assessment and examination

Component	Date	Percent
Examination		20 %
Attendance		5 %
Quiz		5%
seminars		30%
Total		60%

15. Student learning outcome:

After completion of this course, you will be able to:

- Define common terms used in clinical hematology & blood banking.
- Identify all the possible methods for preparation of blood analysis

- Different structure blood
- Identify basic classification of anemia
- Steps of blood banking

16. Course Reading List and References:

1. Turgeon M. L. (2018). Clinical Hematology Theory and Procedures. 6th edition. Philadelphia: Wolters Kluwer
2. Provan D., Trevor B., Inderjeet D., Johannes de vos. (2015) Oxford Handbook of Clinical Haematology. 4th edition. USA by Oxford University press.
3. Denise Harmening (2012). Modern Blood Banking & Transfusion Practices. 6th edition. F. A. Davis Company Philadelphia, PA.

17. The Topics:

Lecturer's name

- | | |
|--|--------------------|
| 1- Haematology & history of heamatology | Week 1 |
| 2- Haemopoiesis | Week 2 |
| 3- Erythropoiesis | Week 3 |
| 4- Haemoglobins | Week 4 |
| 5- Leukopoiesis | Week 5 |
| 6- Leukocytosis | Week 6 |
| 7- Haemostasis and its components | Week 7 |
| 8- Platelets • Blood Vessel Wall • Coagulation System •
Coagulation Regulatory Mechanism • Fibrinolytic System •
Normal Hemostasis | Week 8 |
| 9- Anaemia | Week 9 |
| 10- Iron-Deficiency Anemia | Week 10 |
| 11- Haemolytic anemia (Thalassemia; Sickle cell anemia) | Week 11 |
| 12- Examination 1 | Week 12 |
| 13- Polycythemia | Week 13 |
| 14- Introduction to Acute Leukaemia (Lymphoblastic ALL &
myoblastic Leukemia AML) | Week 14 |
| 15- Introduction to chronic Leukaemia (Lymphoblastic CLL &
myoblastic Leukemia CML) | Week 15
Week 16 |
| 16- Bleeding disorders | |
| 17- Examination 2 | Week 17 |

18. Practical Topics (If there is any)

In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the

Lecturer's name
ex: (3-4 hrs)

19. Examinations:**Q1/ Choose correct answer****(30 marks)**

- 1- The blood is fluid of life about ----- of human body weight
(**a- 7-8%** **b- 6-7%** **c- 8-9%** **d- 6-9%**)
- 2- Plasma is liquid portion of the blood, mainly consists of -----

(**a- Organic , inorganic substances and H₂O** **b- Lipid, protein and H₂O₂** **c- protein, sugar and blood cell** **d- Organic , inorganic substances and protein**)
- 3- HSCs are capable of cell division to give rise to more stem cells is called-----(**a- Differentiation** **b- Self-renewal** **c- Pluripotent** **d- stem cells**)
- 4- Stromal cells are the major source of growth factors except for -----
(**a- erythropoietin** **b- thrombopoietin** **c- Interleukin-3** **d- cytokines**)
- 5- Collectively, the progenitors, precursors, and adult red cells make up an organ termed the ----- (**a- erythron** **b- spleen** **c- blood cells** **d- all of them**)
- 6- Although the erythropoietin response is primarily a function of the severity of ----- (**a- hypoxia,** **b- erythroid marrow mass** **c- inflammatory cytokines** **d- all of them**)
- 7- Which red cells is not a biconcave disc? (**a. Anisocyte** **b. Microcyte** **c. Hypochromic red cells** **d. Spherocyte**)
- 8- Red blood cells which are larger than 8.1 microns are called-----
(**a. Anisocytes** **b. Macrocytes** **c. Microcytes** **d. Normocytes**)
- 9- An iron protein complex which combines with oxygen and carbon dioxide is----- (**a. Deoxyhemoglobin** **b. Hemoglobin** **c. Hemosiderin** **d. Oxyhemoglobin**)
- 10- The Bohr Effect is a physiological phenomenon, stating that hemoglobin's oxygen binding affinity is inversely related both to ---
----- & ----- (**a- Alkalinity & CO₂** **b- Acidity & O₂** **c- acidity & CO₂** **d- Alkalinity & O₂**)
- 11- Most antibodies are ----- globulins (**a- α** **b- β** **c- γ** **d- δ**)

- 12- Water act as----- for blood cells (**a-** Enzyme **b-** polar solvent **c-** polar solute **d-** cofactor)
- 13- In allergic conditions, we commonly find an increase of----- (**a.** Basophil **b.** Eosinophils **c.** Neutrophils **d.** Lymphocytes)
- 14- In which stage of erythrocytic maturation does Hgb formation begin? (**a.** Orthochromic normoblast **b.** Pronormoblast **c.** Basophilic normoblast **d.** Polychromatic normoblast)
- 15- life span of pronormoblast is ----- day (**a-** 1.3 **b-** 1.5 **c-** 2 **d-** 0.8)

Q2/ True or False

(20 marks)

- 1- The lower level of haemoglobin during pregnancy is due to by reduction of plasma volume
- 2- Poikilocytosis significant variation in size of red cells
- 3- Extravascular destruction of red cells by macrophages
- 4- Howell-Jolly bodies are small, spherically shaped DNA remnants
- 5- Heinz bodies are composed of denatured proteins, primarily hemoglobin
- 6- Hemoglobin H is composed of γ 4 tetramers
- 7- Natural killer cells are a type of granulocyte group
- 8- In Orthochromic normoblast, the nucleus appears as a dense blue-black sphere, is known as a pyknotic nucleus
- 9- Changes in the oxygen delivery to tissue are sensed by peritubular interstitial, fibroblast-like cells in the liver.
- 10- The rate of new RBC production varies according to the rate of RBC destruction and Tissue oxygen requirements.

Q3/

- 1- Explain morphological classification of anemia (15 marks)
- 2- Explain Biosynthesis of heme (20 marks)
- 3- Mention various hematopoietic organs during antenatal life (15marks)

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review

پیداچوونہوی ھاوہل

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

نہم کورسبووکہ دہبیت لہ لایہن ھاوہلئیکى ئەکادیمیہوہ سہیر بکریت و ناوہرۆکی بابہتہکانى کورسہکە پەسەند بکات و جەند ووشەیک بنووسیت لەسەر شیاوی ناوہرۆکی کورسہکە و واژووی لەسەر بکات.
ھاوہل ئەو کەسەپە کە زانیاری ھەبیت لەسەر کورسہکە و دہبیت پلہی زانستی لہ ماموستا کەمتر نەبیت.

Theory Lecturer's

Assist. Prof. Dr. Sarbaz I. Mohammed

Haematology/Biology department

College of Science