Course Specification
(Bachelor)

Course Title:	Hematology
Course Code:	BIO 1417
Program:	Bachelor of Science in Biology
Department:	Biology
College:	Science
Institution:	Imam Mohammad Ibn Saud Islamic University
Version:	1
Last Revision Date:	20/8/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 (2Lectures + 2 Laboratory + 0 Tutorials).)

2. Course type

A.	☐University	☒ College	√ Department	☐Track	☐Others
B.	☐Required		√ Elective		

3. Level/year at which this course is offered: (Level seven / Fourth Year)

4. Course general Description:

The Hematology course will cover the diagnosis and management of blood cell disorders, anatomy and physiology of hematopoiesis, routine specialized hematology tests, analysis, classification, and monitoring of blood cell abnormalities.

5. Pre-requirements for this course (if any)**:**

Animal Physiology – BIO314.

6. Co-requisites for this course (if any)**:**

None

7. Course Main Objective(s):

Upon successful completion of this module the student should be able to:

- Describe the characteristics of normal bone marrow and normal circulating blood.
- Describe the functions of hemoglobin, white blood cells, red blood cells and platelets.
- Discuss hemoglobin electrophoresis and abnormal hemoglobin.
- Describe the maturation of red blood cells, white blood cell and platelets.
- Recognize and identify abnormalities in red blood cell morphology and RBC precursors.
- Recognize and identify the causes of an abnormal result in any or all of the parameters of the CBC. (a) RBC b) WBC c) Hemoglobin d) Hematocrit e) Indices f) Differential WBC count).

- **Discuss the etiology, morphological classification, and clinical laboratory findings of the different anemias:(a) Aplastic anemia b) Sideroblastic anemia c) Megaloblastic anemia d) Hemolytic anemias e) Deficiency anemias).**
- **Discuss the etiology, morphology of cells, and clinical laboratory findings of some the different leukemias.**
- **Discuss the etiology, morphology of cells, and clinical laboratory findings of the following hematological disorders: like a) Infectious mononucleosis b) Lupus erythematosus c) Lymphomas.**

Demonstrate an understanding of the role and the main disciplines of Biomedical Science in the day to day operation of a Hematology laboratory.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	70%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning	√	30%
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**30**
2.	**Laboratory/Studio**	**30**
3.	**Field**	**0**
4.	**Tutorial**	**0**
5.	**Others (specify)**	
Total		**60**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	To define the scope and function of a Haematology.	Panel of discussions and dialogue, including discussion of small groups.	• Written tests. • Oral tests.	To define the scope and function of a Haematology.
1.2	To write about methods how controls and standards are used in Haematology.	Laboratory method process (experiments) and view reports.	Work – papers and research papers.	To write about methods how controls and standards are used in Haematology.
...				
2.0	**Skills**			
2.1	To estimate basics of the correct operation of laboratory equipment and understand the principles and quality assurance of the equipment.	Mental focus.	Performance of written tests.	To estimate basics of the correct operation of laboratory equipment and understand the principles and quality assurance of the equipment.
2.2	To compare between manual and automated measurements.	Find the collective research.	Performance mimicry tests.	To compare between manual and automated measurements.
2.3	To prepare and use of a Romanowsky stain.	Reciprocal teaching and the similes.	Work sample tests.	To prepare and use of a Romanowsky stain.
3.0	**Values, autonomy, and responsibility**			
3.1	To evaluate Group leadership skill and to evaluate the responsibility.	Teaching colleagues.	Self-report methods.	To evaluate Group leadership skill and to evaluate the responsibility.
3.2	To interpret linking between science and	Collective research project and writing	Assigning students to conduct research using the Internet	To interpret linking between science and

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	technology with society.	reports and presenting its display.	and modern technology.	technology with society.
3.3	To manipulate the operation and use of computers and means of modern technology.	Default- laboratories Illustrated presentations.	Recording student performance.	To manipulate the operation and use of computers and means of modern technology.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction: Definition of Hematology, what is blood, Blood composition. The scope of Hematology.	2
2.	The Erythrocytes, Red Blood Corpuscles (RBCs), Haemopoieses, RBCs cell lines in bone marrow	2
3	Hemoglobin, Haemoglobinopathy. Aspect of Anaemia, Types of anaemia. Iron deficiency anemia & other hypochromic microcytic anemias. Megaloblastic anemia. Hemolytic Anemias I- Introductions & Classification Hemolytic Anemias II- Structural hemoglobinopathies. Hemolytic Anemias III-Thalassemia	6
4	• Hemolytic Anemias IV- Membrane abnormalities. • Hemolytic Anemias V- Enzymopathies. • Hemolytic Anemias VI- Immune Hemolytic Anemias. • Aplastic Anemia. • Anemia of chronic disorders. • Malaria. Summary of red cell morphologic abnormalities	6
5	White Blood Cells (WBCs), Types of WBCs, Formation of WBCs. Normal WBCs, Myeloproliferative disorders	4
6	• White cells and their benign disorders. • Leukemias-introductions & classification: • Acute leukemia. • Chronic myeloid leukemias. • Chronic Lymphocytic leukemias. Myelodysplastic syndromes & other preleukemic conditions.	4
7	• Physiology of coagulation & Hemostasis. • Bleeding disorders - Introduction & Classification. • Congenital bleeding disorders.	6

	• Acquired bleeding disorders. • Congenital platelet disorders. • Acquired platelet disorders. • Thrombophilic disorders & Their diagnosis. (Thrombocytopenia- thrombocytosis**).**	
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm 1	Around 6th -7th week	15%
2.	Midterm 2	Around11th-12thweek	15%
3.	Quizzes, Attendance, Participation, Home works.	All the semester	10%
4	Lab reports.	All the semester	5%
5	Lab Exam.	Around 15th week	15%
6	Final Exam.	Around15th-16thweek	40%
7	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Essential Haematology' Hoffbrand A.V. Moss P.A.H. & Pettit J.E. 5th Edition, 2007, Blackwell. Publishing Principles of Laboratory Instruments' Schoef L.E. & Williams R.H. 1993 Mosby - ISBN 08016749-1.
Supportive References	• Dacie and Lewis Practical Haematology' SM Lewis, BJ Bain, I Bates10th Edition, 2012, Churchill Livingstone Elsevier. ISBN 9780702034077 Kandice Kottke-Marchant.Laboratory Hematology Practice 1st Ed (2012).ISBN-13: 978-1405162180
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• A (Stage), with an integrated audio system and microphones connected to the Internet and networks 2 Wired and wireless (optical fiber), and air conditioning system and modern suitable lighting. • Hall dedicated to educational films with moving chairs and a DVD player, and TV. • 60-inch (, conditioning system with a modern and appropriate lighting.). • Laboratories equipped with the latest electrical appliances, chemical and all chemicals and tools Safety and means to study the practical courses. Hall dedicated to lectures e-learning
Technology equipment (projector, smart board, software)	• A computer for display and use of data with a slide show presentation. • High-device "projectors" Lighting. It is assumed that each student has its own computer
Other equipment (depending on the nature of the specialty)	Specific laboratory equipment for this course including posters, models of different experimental animals , dissection instruments, light microscopes, dissection microscopes, microtome instrument, slide preparations, mixer, fluorescent microscopes ,spectrophotometer ELISA unit for detecting Ag- Ab reactions ,instrument of gel electrophoresis ,hematocrit centrifuge , automated CBC analyzer , centrifuges , incubators , ovens , other glass wares special for hematology and automated micropipettes.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	At the end of the course each student will complete an evaluation form which it will be used by the faculty to	Direct

Assessment Areas/Issues	Assessor	Assessment Methods
	evaluate the course feedback and the instructor.	
Effectiveness of Students assessment	completes a report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary	Direct
Quality of learning resources	Follow up of faculty members by specialized committees devoid of bias and criticism.	Indirect
The extent to which CLOs have been achieved	Check a sample of marking by independent faculty member.	Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	