

<b>Name of Faculty</b>	:	Faculty of Science
<b>Name of Program</b>	:	Bachelor of Science
<b>Course Code</b>	:	2BSL01
<b>Course Title</b>	:	Hematology and blood banking
<b>Type of Course</b>	:	Professional Core
<b>Year of Introduction</b>	:	2023-24

<b>Prerequisite</b>	:	These course objectives align with the syllabus and aim to provide students with a well-rounded understanding of Hematology and Blood Banking, enabling them to apply their knowledge effectively in clinical and laboratory settings.
<b>Course Objective</b>	:	Develop critical thinking skills for diagnosing and managing hematological disorders and blood banking issues. Cultivate a strong foundation in the principles and practices of Hematology and Blood Banking. Promote ethical awareness and regulatory compliance in the field. Enhance communication and collaboration skills, especially when working with healthcare teams.
<b>Course Outcomes</b>	:	At the end of this course students will be able to:
	CO1	Understand the principles of blood banking and its importance in patient care.
	CO2	Analyze the characteristics and management of sickle cell disease and thalassemias.
	CO3	Evaluate emerging trends and innovations in transfusion medicine.
	CO4	Application of an understanding of hemostasis and coagulation disorders.

### Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	2	4	50	25	50	25	150

*Legends: L-Lecture; T-Tutorial/Teacher Guided Theory Practice; P - Practical, C - Credit, SEE - Semester End Examination, CIA - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

**Course Content**

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	<b>Introduction to Hematology and Blood Banking</b> Overview of Hematology and Blood Banking as a field Blood components and their functions Blood cell production and differentiation Hematopoiesis and the bone marrow Blood banking and its importance in healthcare	10	25%	CO1
2	<b>Hematological Disorders</b> <b>Red Blood Cell Disorders</b> Anemia types, causes, and diagnosis Sickle cell disease and thalassemias Hemoglobinopathies and their management Polycythemia and related conditions Red blood cell transfusions and complications <b>White Blood Cell Disorders</b> Leukemia: Types, classification, and symptoms Lymphomas: Hodgkin and Non-Hodgkin lymphomas Myeloproliferative disorders Bone marrow disorders and myelodysplastic syndromes	14	25%	CO2
3	<b>Blood Banking and Transfusion Medicine</b> Blood collection, processing, and storage Compatibility testing and crossmatching Blood transfusion reactions and their management Emerging trends in transfusion medicine Regulatory and ethical aspects of blood banking	10	25%	CO3
4	<b>Advanced Hematology and Blood Banking</b> Hemostasis and coagulation disorders Platelet disorders and bleeding disorders Blood component therapy and alternatives Quality assurance in blood banking Case studies and real-world applications Review and final assessments	11	25%	CO4

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create

<b>Weightage</b>	-	25	25	25	25	-
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NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

### Suggested List of Experiments

Sr. No.	Name of Experiment	Teaching Hours
1.	Students examine blood smears under a microscope to identify and describe different blood cell types (red blood cells, white blood cells, and platelets).	02
2.	Using hematopoietic stem cell models, students simulate the process of hematopoiesis to understand how different blood cell types are produced.	02
3.	Perform ABO and Rh blood typing on blood samples and practice crossmatching to understand blood compatibility for transfusions.	02
4.	Analyze patient case studies and laboratory results to diagnose and classify different types of anemia.	02
5.	Use molecular models or computer simulations to illustrate the molecular basis of sickle cell disease.	02
6.	Examine bone marrow or lymph node biopsies to identify and classify leukemia and lymphoma cells.	02
7.	Practice proper blood collection techniques, including venipuncture and blood bag preparation.	02
8.	Perform blood type determination and crossmatching using real blood samples and donor units.	02
9.	Simulate and manage various transfusion reactions in controlled settings.	02
10.	Analyze coagulation profiles from patient samples and interpret the results to diagnose coagulation disorders.	02
11.	Perform platelet aggregation studies to evaluate platelet function.	02
12.	Evaluate different blood component therapies and simulate the preparation and administration of blood products.	02
13.	Conduct quality control tests on blood products and assess their compliance with standards.	02
14.	Work through real or hypothetical patient case studies related to hematological disorders and blood banking issues.	02
15.	Explore and discuss regulatory guidelines and ethical considerations related to blood banking and patient care.	02

### Major Equipment /Instruments

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Blood Type Kit

2	Microscope
3	Hematopoiesis Models
4	Clinical case Study
5	Molecular Models
6	Blood Collation Supplies
7	Blood Bags
8	Cross matching Supplies
9	Coagulate Assay Equipment
10	Platelate Aggregate equipment
11	Quality Control Material
12	Blood Component preparation kit

#### Suggested Learning Websites

Sr. No.	Name of Website
1	<a href="https://dth.ac.in/medical/course-inner.php?id=127">https://dth.ac.in/medical/course-inner.php?id=127</a>
2	<a href="https://dth.ac.in/medical/course-inner.php?id=119">https://dth.ac.in/medical/course-inner.php?id=119</a>
3	<a href="https://dth.ac.in/medical/course-inner.php?id=118">https://dth.ac.in/medical/course-inner.php?id=118</a>

#### Reference Books

Sr. No.	Name of Reference Books
1	" <b>Hematology: Clinical Principles and Applications</b> " by Bernadette F. Rodak, George A. Fritsma, and Elaine M. Keohane
2	" <b>Blood Banking and Transfusion Medicine: Basic Principles and Practice</b> " by Christopher D. Hillyer, Leslie E. Silberstein, and Paul M. Ness
3	" <b>Clinical Hematology and Fundamentals of Hemostasis</b> " by Denise M. Harmening
4	" <b>Essential Haematology</b> " by Victor Hoffbrand and Paul A.H. Moss
5	" <b>Clinical Laboratory Hematology</b> " by Shirlyn B. McKenzie, Lynne Williams, and Turgeon, Mary Louise