

FACULTY OF LIFE SCIENCES

Syllabus for
Bachelor of Science (Honours) (Medical Laboratory Technology)
Semester: III-IV
(Under Credit Based Continuous Evaluation Grading System)
(Session: 2026-27)



Kanya Maha Vidyalaya, Jalandhar (Autonomous)

The Heritage Institution

KANYA MAHAVIDYALAYA, JALANDHAR (AUTONOMOUS)
SCHEME AND CURRICULUM OF EXAMINATIONS OF FOUR-YEAR DEGREE PROGRAMME
(Session: 2026-27)

Bachelor of Science (Honours) (Medical Laboratory Technology) Semester -III											
Course Code	Course Title	Course Type	Total Credits	Credit Hours			Total Marks	Marks			Exam Time in Hrs
				L	T	P		L	P	CA	
BMLL-3481	Hematology- II	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-3481	Hematology- II Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL- 3482	Pathology- I	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-3482	Pathology-I Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL-3483	Clinical Biochemistry-I	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-3483	Clinical Biochemistry-I Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL-3064	Introduction to Bacteriology and Virology	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-3064	Introduction to Bacteriology and Virology Lab	DSC	0-0-1	-	-	2	50	-	35	15	3
BMLL-3065	Basics of Microbiology-I	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-3065	Basics of Microbiology-I Lab	DSC	0-0-1	-	-	2	50	-	35	15	3
VACE- 3221	Environmental Studies (Compulsory)	VAC	2-0-0	2	-	-	50	35	-	15	3
Total Credits			25								

DSC- Discipline Specific Course

VAC- Value Added Course

KANYA MAHAVIDYALAYA, JALANDHAR (AUTONOMOUS)
SCHEME AND CURRICULUM OF EXAMINATIONS OF FOUR-YEAR DEGREE PROGRAMME
(Session: 2026-27)

Bachelor of Science (Honours) (Medical Laboratory Technology) Semester -IV											
Course Code	Course Title	Course Type	Total Credits	Credit Hours			Total Marks	Marks			Exam Time in Hrs
				L	T	P		L	P	CA	
BMLL-4481	Hematology-III	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-4481	Hematology-III Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL-4482	Pathology-II	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-4482	Pathology-II Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL-4483	Clinical Biochemistry-II	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-4483	Clinical Biochemistry-II Lab	DSC	0-0-2	-	-	4	50	-	35	15	3
BMLL-4064	Basics of Microbiology-II	DSC	3-0-0	3	-	-	100	70	-	30	3
BMLP-4064	Basics of Microbiology-II Lab	DSC	0-0-1	-	-	2	50	-	35	15	3
BMLL-4485	Immunology-I	MDC	3-0-0	3	-	-	100	70	-	30	3
BMLP-4485	Immunology-I Lab	MDC	0-0-1	-	-	2	50	-	35	15	3
BMLL-4320	Entrepreneurship and Small Business	SEC	3-0-0	3	-	-	100	70	-	30	3
VACP-4511	*Personality Development and Gender Sensitization	VAAC	2-0-0	2	-	-	50	35	-	15	1
Total Credits			28								

*Credits of these papers will not be added in SGPA/CGPA and only grades will be provided.

DSC- Discipline Specific Course

VAAC- Value Added Audit Course

MDC- Multi Disciplinary Course

SEC- Skill Enhancement Course

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Hematology-II
Course Code: BMLL- 3481
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand the symptoms and clinical history related to various diseases.

CO2: Gain knowledge about different types of Anemia.

CO3: Understand the hemolytic disease of newborn.

CO4: Learn about bacterial, viral and fungal infections.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Hematology-II
Course Code: BMLL- 3481
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Hematological Disorders: Anemia, various types of anemia, Megaloblastic Anemia, Iron deficiency Anemia, Hemolytic Anemia, Pernicious Anemia, Sideroblastic anemia, Sickle Cell anemia

Unit II

Thalassemia, Polycythemia, Leukemia, Multiple Myeloma, Di-Gugliermo Syndrome, Hereditary Spherocytosis

Unit III

Hereditary Elliptocytosis, Haemolytic disease of newborn, Infectious Mononucleosis

Unit IV

Protozoal infections, bacterial infections, viral infections, fungal infections

Books Recommended:

1. Godkar, PB and Godkar, DP (2008) Text Book of Medical Laboratory Technology, 2nd edition Bhalani Publishing House, Mumbai, India.
2. Martin R. Howard and Peter J Hamilton (2013) Text Book of Hematology, 4th edition, Churchill Livingstone.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Hematology-II Lab
Course Code: BMLP - 3481
(PRACTICAL)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn about basic hematological laboratory testing.

CO2: To study determination of hemoglobin.

CO3: To understand TLC and TRBC techniques using hemocytometer.

CO4: Distinguish between the normal and abnormal hematological findings to predict the diagnosis of disorders and diseases.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Hematology-II Lab
Course Code: BMLP - 3481
(PRACTICAL)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-2

Practical: 35

CA: 15

1. Study of microscope.
2. Determination of Hemoglobin
3. TLC by Hemocytometer
4. TRBC count by Hemocytometer
5. Differential Leukocyte count
6. Determination of Platelet count

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Pathology - I
Course Code: BMLL- 3482
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand the use of microscopy and staining techniques for disease diagnosis.

CO2: To gain the knowledge about diseases of Alimentary canal.

CO3: Learn about various diseases of Accessory digestive glands and its pathology.

CO4: Understand the diseases of circulatory system.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Pathology-I
Course Code: BMLL- 3482
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Microscopy-Working principle, maintenance, and applications of various types of microscopes, Light microscopy and its types, Fluorescence microscopy, Electron microscopy.

Staining: Metachromasis and metachromatic dyes, hematoxylin stain, MGG, Papanicolaou stain, special stains like PAS, Mucicarmine, Alcain blue, Schmorl, and Acid phosphatase.

Unit II

Alimentary and digestive system: - Disease of mouth and esophagus, gastritis, peptic ulceration, pathology of appendicitis, food poisoning, hernia, intestinal obstructions & malabsorption.

Unit III

Accessory Digestive glands: Diseases of Salivary glands-mumps, Salivary gland tumours, Liver disease– Hepatitis, liver failure, cirrhosis, hepatocellular carcinoma, fatty liver disease.

Pancreatic diseases: pancreatitis, Gall bladder diseases: Gall stones, jaundice.

Unit IV

Circulatory System: - Disease of Blood vessels- Atheroma, Atherosclerosis, Disorders of Blood Pressure – Hyper & Hypotension and cardiovascular diseases- coronary artery disease, Heart Failure, Arrhythmia.

Recommended Books:

1. Textbook of Pathology by Harsh Mohan (2015). Jaypee Brothers Medical Publishers (P) Ltd. New Delhi, India.
2. Muir's Textbook of Pathology (2014) edited by C. Simon Herrington. CRC press USA.
3. Textbook of Pathology (2004) by V Krishna. Orient Longman Pvt. Ltd, India.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Practical in Pathology-I
Course Code: BMLP - 3482
(PRACTICAL)

Course Outcomes

After passing this course the student will be able to:

CO1: To understand the use of microscope and its care.

CO2: Learn mounting and staining techniques

CO3: Learn about bio-medical waste management, record keeping, and universal precautions to keep themselves safe.

CO4: To study the slide preparation of organs of digestive and circulatory system.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Pathology-I Lab
Course Code: BMLP - 3482
(PRACTICAL)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-2

Practical: 35

CA: 15

1. Study of various types of microscopes, Use & care of Microscope.
2. Mounting and staining techniques.
3. Maintenance of records and slides and Bio-Medical waste management.
4. To study stained slide preparation from organs of the digestive system.
5. To study stained slide preparation from organs of the circulatory system.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)

Course Title: Clinical Biochemistry-I

Course Code: BMLL- 3483

(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Collect specimen, process, and handle clinical laboratory, interpret results etc.

CO2: Know about body fluids and their importance.

CO3: Learn procedure of various assays viz. glucose in blood, serum, plasma, and urine etc.

CO4: Learn to calculate normal Range, Reference Values, principles, and assay procedures of proteins, urea, uric acid, creatinine, bilirubin, and lipids in blood, serum, plasma, and urine.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Clinical Biochemistry-I
Course Code: BMLL- 3483
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Introduction: Definition and scope of clinical biochemistry in diagnosis; Specimen collection, processing, and handling in clinical laboratory; Sources of biological variation; Use of clinical laboratory and interpretation of results; Quality control and quality assurance.

Unit II

Body Fluids and their Importance: Milk, Colostrum, Aqueous humor, Cerebrospinal fluid, Amniotic fluid, Assessment of fetal maturity.

Unit III

Assay Procedures 1: Normal range, reference values, principles, and assay procedures of glucose in blood, serum, plasma, and urine; type of diabetes and its complications; glucose tolerance test.

Unit IV

Assay Procedures 2: Normal Range, Reference Values, principles, and assay procedures of proteins, urea, uric acid, creatinine, bilirubin, and lipids in blood, serum, plasma, and urine.

Books Recommended

1. Vasudevan D, Sreeekumari S and Vaidyanathan K (2016) Textbook of Biochemistry for Medical Students. 8th Edition. Jaypee Brothers Medical Publishers (P) Ltd.
2. Godkar PB and Godkar DP (2014) Textbook of Medical Laboratory Technology (Vol 1 and 2) by P.B. Godkar. Bhalani Publishing House.
3. Chaterjea MN and Shinde R (2012) Text book of Medical Biochemistry. 8th Edition.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Clinical Biochemistry-I Lab
Course Code: BMLP - 3483
(PRACTICAL)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn how to collect and store blood.

CO2: Gain knowledge about preparation of serum and plasma.

CO3: Learn to detect Hb through various methods.

CO4: Understand detection of glucose in urine.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–III
(Session: 2026-27)
Course Title: Clinical Biochemistry-I Lab
Course Code: BMLP - 3483
(PRACTICAL)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-2

Practical: 35

CA: 15

1. Collection and storage of blood
2. Preparation of serum
3. Preparation of plasma
4. Determination of Hb using a hemoglobinometer
5. Determination of Hb using alkaline hematin method
6. Determination of hematocrit
7. Estimation of blood glucose
8. Detection of glucose in urine by Benedict reagent
9. Detection of glucose in urine by Fehling's reagent

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Hematology-III
Course Code: BMLL- 4481
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn about coagulation

CO2: Learn about various laboratory techniques and procedures theoretically

CO3: Theoretical analysis of blood

CO4: Handle samples and learn various techniques like serum separation, CBC, ESR.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Hematology-III
Course Code: BMLL- 4481
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Coagulation and mechanism of coagulation, Blood coagulation, Anticoagulants, Routine coagulation Tests, Automated coagulation system

Unit II

Characteristics of good technician, Preparation of specimen collection material, lab request form, vein puncture and its complications

Unit III

Specimen rejection criteria for blood specimen, Haemolysis of blood, Blood collection by skin puncture, Arterial puncture

Unit IV

Separation of serum, plasma, changes in blood on keeping, maintenance of specimen, identification & transport of the specimen, Complete blood count (CBC), ESR

Books Recommended:

1. Godkar, PB and Godkar, DP (2008) Text Book of Medical Laboratory Technology, 2nd edition Bhalani Publishing House, Mumbai, India.
2. Martin R. Howard & Peter J Hamilton (2013) Text Book of Hematology, 4th edition, Churchill Livingstone.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Hematology-III Lab
Course Code: BMLP- 4481
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: Perform basic hematological laboratory testing, assess laboratory data and report findings according to laboratory protocol.

CO2: Adapt hematology laboratory techniques and procedures when errors and discrepancies in results are obtained to effect resolution in a professional and timely manner.

CO3: Distinguish normal and abnormal hematological laboratory findings to predict the diagnosis of hematological disorders and diseases.

CO4: Recognize laboratory results consistent with leukemia and other white blood cell disorders.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Hematology-III Lab
Course Code: BMLP- 4481
(Practical)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-2

Practical: 35

CA: 15

1. Determination of Blood group
2. Absolute Eosinophil count
3. Morphology of Red Blood Cells
4. Determination of Malarial Parasite
5. Determination of Bleeding Time
6. Determination of clotting time

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Pathology-II
Course Code: BMLL- 4482
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Know about diseases of respiratory system

CO2: Learn about various urinary tract disorders and diseases

CO3: Understand pathology behind sexually transmitted diseases

CO4: Gain knowledge about genital tract diseases.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Pathology-II
Course Code: BMLL- 4482
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Respiratory System: Upper Respiratory Tract Infections (URTIs), Diseases of Bronchi; Bronchitis and Asthma, Diseases of Lung; Pneumonia, Fungal infections of the lung, Lung abscess, Tuberculosis, and Lung Collapse.

Unit II

Urinary System: Glomerulonephritis, Nephrotic syndrome, Acute Renal failure, Chronic Kidney disease, Renal calculi, Urinary obstruction, Urinary tract infections.

Unit III

Sexually Transmitted Diseases: Common Sexually transmitted diseases (STDs); Chlamydia, Gonorrhoea, Syphilis, Genital herpes, Human papillomavirus (HPV), and HIV/AIDS.

Unit IV

Male and Female Genital Tract: - Prostatitis, erectile dysfunction, testicular disorders, pelvic inflammatory disease, disorder of cervix; cervical intraepithelial neoplasia (CIN), disease of ovaries, ectopic pregnancy, prostatitis, infertility.

Recommended Books:

1. Textbook of Pathology by Harsh Mohan (2015). Jaypee Brothers Medical Publishers (Pvt) Ltd. New Delhi, India
2. Muir's Textbook of Pathology (2014) edited by C. Simon Herrington. CRC Press USA
3. Textbook of Pathology (2004) by V Krishna. Orient Longman Pvt. Ltd, India

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Pathology-II Lab
Course Code: BMLP- 4482
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn about Pancreas and Liver through permanent slides

CO2: Study gall bladder through permanent slides

CO3: Study the stained slide preparation from organs of the Respiratory system

CO4: Understand stained slide preparation from organs of the Urinary system

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Pathology-II Lab
Course Code: BMLP- 4482
(Practical)

Credits: 0-0-2

Total Marks: 50

Time: 3 Hours

Practical: 35

CA: 15

1. To study stained slides of the liver and pancreas
2. To study stained slides of the gall bladder
3. To study stained slide preparation from organs of the Respiratory system
4. To study stained slide preparation from organs of the Urinary system

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Clinical Biochemistry-II
Course Code: BMLL- 4483
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Know about electrolyte and water balance

CO2: Learn about pH and buffers

CO3: Understand Acid-Base Balance and Disorders

CO4: Know about Detoxification and Biotransformation of Xenobiotics

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Clinical Biochemistry-II
Course Code: BMLL- 4483
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Electrolyte and Water Balance: Electrolyte concentration of body fluid compartments, Regulation of sodium and water balance: Anti-Diuretic Hormone (ADH), Renin-angiotensin system; Donnan membrane equilibrium, Osmolality; Disturbances in Fluid and Electrolyte Balance; Clinical applications of Sodium, Potassium, and Chloride: Hyponatremia, Hyponatremia, Hypokalemia, Hyperkalemia, Hyperchloremia, Hypochloremia

Unit II

pH and buffers: Introduction to pH: definition of pH, the pH scale: acidic, neutral, and basic solutions; Mathematical expression of pH; Relationship between pH and hydrogen ion concentration; Importance of pH in various fields; Concept of buffers and buffer capacity; Buffers of body fluids; Henderson-Hasselbalch equation; Maintenance of body pH; Buffers of body fluids.

Unit III

Acid-Base Balance and Disorders: Acids and bases, Respiratory regulation of pH, Renal regulation of pH, Titra table acid, Disturbances in acid-base balance, Anion gap, Metabolic acidosis, Metabolic alkalosis, Respiratory acidosis, Respiratory alkalosis.

Unit IV

Detoxification and Biotransformation of Xenobiotics: Phase one reactions, Oxidative reactions, Reductive reactions, Hydrolysis, Phase two reactions, Conjugation, Phase three reactions.

Books Recommended:

1. Vasudevan D, Sreeekumari S and Vaidyanathan K (2016) Textbook of Biochemistry for Medical Students.8thEdition. Jaypee Brothers Medical Publishers (P) Ltd.
2. Godkar PB and Godkar DP (2014) Textbook of Medical Laboratory Technology (Vol 1 and 2) Bhalani Publishing House.
3. Chaterjea MN and Shinde R (2012) Textbook of Medical Biochemistry. 8th Edition Jaypee Brother Medical Publisher.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Clinical Biochemistry-II Lab
Course Code: BMLP- 4483
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn about collection and storage of urine

CO2: Estimate proteins in plasma and calculation of A/G ratios

CO3: Estimate serum urea and creatinine

CO4: Estimate serum uric acid

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Clinical Biochemistry-II Lab
Course Code: BMLP- 4483
(Practical)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-2

Practical: 35

CA: 15

1. Collection and storage of urine
2. Estimation of proteins in urine
3. Estimation of proteins in plasma and calculation of A/G ratios
4. Estimation of serum urea
5. Estimation of serum creatinine
6. Estimation of serum uric acid

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Immunology-I
Course Code: BMLL- 4485
(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Know about Types of immunity and immune response.

CO2: Gain knowledge about Primary and secondary lymphoid organs.

CO3: Understand antibodies and its types.

CO4: Know about Antigen-antibody interactions.

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester-IV
(Session: 2026-27)

Course Title: Immunology-I
Course Code: BMLL- 4485
(THEORY)

Time: 3 Hours

Total Marks: 100

Credits: 3-0-0

Theory: 70

CA: 30

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions of section A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. Each question carries 14 marks.

Unit I

Types of immunity: Innate immunity-Physical barriers, cellular components, soluble molecules; Adaptive immunity-T-cell and B-cell mediated responses.

Features of immune response: Primary vs. secondary immune response.

Unit II

Primary lymphoid organs: Thymus-Structure, T-cell development; Bone Marrow-Structure, B-cell development.

Secondary lymphoid organs: Spleen-Structure and functions; Lymph nodes-Structure, functions, and lymphocyte trafficking; Lymphatic system - Role in immunity; Mucosa Associated Lymphoid Tissue (MALT) – Structure and functions.

Cells of Immune system: T-cells-Types, functions, and development; Bcells - Types, functions, and development; NK cells-Role in immunity; Macrophages- Phagocytosis and antigen presentation.

Unit III

Antibodies: Classes-IgG, IgM, IgA, IgE, IgD; Structure-Heavy and light chains, variable and constant regions.

Antigens and their characteristics: Antigenicity vs. immunogenicity; Types of antigens: complete and haptens.

Unit IV

Affinity and avidity: Definitions and differences; Importance in antigen-antibody interactions. **Antigen-antibody interactions:** Principles of binding; Techniques- Precipitation, agglutination, immunofluorescence.

Books Recommended:

1. Abbas, A.K., Litchman, A.H. (2006-2007). Basic Immunology: Functions and Disorders of the Immune System, 2nd Ed. (updated edition), Philadelphia, Pennsylvania: W.B. Saunders Company Publishers.
2. Benjamini, E., Coico, R. and Sunshine, G. (2009). Immunology: A Short Course, 6th Ed., New York, Wiley-Blackwell.
3. Roitt, I.M., Delves, P. Seamus M. and Burton D. (2006). Essential Immunology, 11th Ed., Willey- Blackwell.
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Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Immunology-I Lab
Course Code: BMLP- 4485
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: Learn blood group testing

CO2: Separation of serum and plasma from blood

CO3: Examine Peripheral Blood Film (PBF)

CO4: Learn to store serum and plasma

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–IV
(Session: 2026-27)
Course Title: Immunology-I Lab
Course Code: BMLP- 4485
(Practical)

Time: 3 Hours

Total Marks: 50

Credits: 0-0-1

Practical: 35

CA: 15

1. Blood Group testing
2. Separation of serum from blood
3. Separation of plasma from blood
4. Peripheral Blood Film (PBF) examination
5. Storage of serum and plasma

Bachelor of Science (Honours) (Medical Laboratory Technology) Semester–V
(Session: 2026-27)
Course Title: Hematology-IV
Course Code: BMLL- 5481
(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Learn about Blood groups and their inheritance.

CO2: Know about blood donors, acceptors and blood rejection.

CO3: Understand human circulatory system.

CO4: Learn about Human heart and its working.