

FACULTY OF LIFE SCIENCES

Syllabus for

Bachelor of Science (Medical)

(SEMESTER: V-VI)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2026-27



**Kanya Maha Vidyalaya, Jalandhar (Autonomous)
The Heritage Institution**

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)
SCHEME AND CURRICULUM OF EXAMINATIONS OF THREE YEAR DEGREE

PROGRAM

Session-2026-27

Bachelor of Science (Medical) (Honours) Semester -V										
Course Name	Paper	Course Code	Course Type	Credits L-T-P	Hours per week L-T-P	Total Marks	Marks			Exam Time in Hrs
							L	P	CA	
Zoology	Biomolecules	BSML-5483	DSC	4-0-0	4-0-0	100	70	-	30	3
	Biomolecules Lab	BSMP-5483	DSC	0-0-2	0-0-4	50	-	35	15	3
	Internship	BSMI-5486	CCFR	0-0-2	0-0-4	50	-	50	-	-
Bachelor of Science (Medical) (Honours) Semester -VI										
Zoology	Animal Physiology	BSML-6483	DSC	4-0-0	4-0-0	100	70	-	30	3
	Animal Physiology Lab	BSMP-6483	DSC	0-0-2	0-0-4	50	-	35	15	3

Bachelor of Science (Medical) Semester–V (Session 2026-27)

Course Title: Zoology (Biomolecules)

Course Code: BSML-6483

(THEORY)

Course Outcome

After successfully completing this course, students will be able to:

CO1: Understand the chemical basis of life including water, atoms, molecules, and bonding interactions.

CO2: Classify and explain structure and properties of amino acids, peptides, and proteins.

CO3: Describe structure, classification, and functions of carbohydrates and lipids.

CO4: Explain the chemistry and biological roles of nucleotides and nucleic acids.

Bachelor of Science (Medical) Semester–V (Session 2026-27)
Course Title: Zoology (Biomolecules)
Course Code: BSML- 6483
(THEORY)

Examination Time: 3 Hrs.
L-T-P: 4-0-0

Max Marks: 100
Theory: 70
CA: 30

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections 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 will carry 14 marks.

UNIT- I

Chemistry of Life

Water as an essential substance for life.

Atoms and Molecules (Types of bonds and interaction).

UNIT- II

Amino Acids- Classification of amino acids, Amphoteric amino acids, Acid base properties of amino acids, primary, secondary, tertiary.

Peptides: Ionisation behavior of peptides

Proteins: Structural and functional proteins, levels of proteins structural and quaternary protease Structure

UNIT- III

Carbohydrates: Mono, di and polysaccharides.

Lipids: Storage and structural lipids.

Lipids as signals, cofactors and pigments.

UNIT- IV

Nucleotides and Nucleic acids

Nucleic acids types Chemistry of nucleic acids

Functions of nucleotides and nucleic acids

Suggested Readings:

- Abeles, R.H., Fray, P.A. and Jencks, W.P. (1992) Biochemistry, Jones and Bartlett Publishers, London.
- Berg, J. M., Tymoczko, J.L. and Stryer (2002) Biochemistry (5th Ed.) W.H. Freeman and Co., NY.
- Cohn, E.E., Stump. P.K., Bruening, G. and Doi, R.H. (1987) Outlines of Biochemistry (5th Ed) Johan Wiley & Sons, NY.

- Elliott, W.H. and Elliot, D.C. (2001) Biochemistry & Molecular Biology (Second Edition) Oxford University Press, New York.
- Horton, H.R., Moran, L.A., Ochs, R.S. Rawn, J.D. and Scrimgeour, K.G. (2002) Principles of Biochemistry (3rd Ed.) Prentice Hall Upper Saddle River N.J. 07458.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W (2009) Harper's Illustrated Biochemistry (Twenty Sixth Edition) Mc Graw Hill.
- Nelson, David L. and Cox, Michael M. (2000). Lehninger Principles of Biochemistry (3rd Edition) Mc Millan Worth Publishers.
- Rawn, J.D. (1983) Biochemistry. Harper and Raw Publishers, New York.
- Vasudevan, D. M. and Sree Kumari, S. (2001) Text Book of Biochemistry (3rd Ed.) Jaypee Brothers Medical Publisher (P) Ltd. New Delhi.
- Voet, D. and Voet, J.G. (2015) Biochemistry (4th Ed.) John Wiley and Sons, NY.
- Zubay, G. (1998). Biochemistry (4th Edition) Wm.C. Brown Publishers, USA.

Bachelor of Science (Medical) Semester–V (Session 2025-26)
Course Title: Zoology (Biomolecules Lab)
Course Code: BSMP-5483
(PRACTICAL)

Course Outcomes

After successfully completing this course, students will be able to:

- CO1:** Prepare and understand different buffer systems and measure pH of solutions.
- CO2:** Perform calculations related to molarity, molality, and normality.
- CO3:** Estimate biomolecules such as carbohydrates, lipids, and proteins in given samples.
- CO4:** Isolate and study DNA from biological samples.

Bachelor of Science (Medical) Semester–V (Session 2026-27)
Course Title: Zoology (Biomolecules Lab)
Course Code: BSMP-5483
(PRACTICAL)

Time: 3 hrs
L-T-P: 0-0-2

Max. Marks: 50
Practical: 35
CA: 15

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. To study different types of buffers and their preparations.
2. To study pH of different types of solution.
3. To study Molarity, Molality, Normality and related numericals.
4. To analyse carbohydrate content in a given sample.
5. To analyse lipid content in a given sample.
6. To study protein content of a given sample.
7. To study extraction of DNA from given sample.

Note:- Some changes can be made in the practical depending on the availability of material.

Bachelor of Science (Medical) Semester–V (Session 2026-27)

Course Title: Zoology (Internship)

Course Code: BSMI-5486

L-T-P: 0-0-2

Max. Marks: 50

Students shall undertake Community Engagement and Service/ field based learning through an internship of four weeks during the fifth semester after completion of classes or during the summer vacation at the end of the fourth semester.

The internship shall be carried out in one of the areas related to the courses of study. Students participating in NCC or NSS activities may submit a certificate of participation for a minimum duration of four weeks in lieu of the internship.

Every student shall submit an internship report in the prescribed format along with the original internship completion certificate and permission letter issued by the college to carry out the internship/ community outreach.

The viva voce examination shall be conducted on the basis of the final internship report submitted and the presentation by the student.

Bachelor of Science (Medical) Semester–VI (Session 2026-27)

Course Title: Zoology (Animal Physiology)

Course Code: BSML-6483

(THEORY)

Course Outcome

After successfully completing this course, students will be able to:

CO1: Understand the mechanisms of digestion, respiration, and transport of gases in animals.

CO2: Explain the functioning of circulatory system including heart, blood, blood pressure regulation and Excretion.

CO3: Describe muscle contraction, nerve impulse transmission, and neural integration.

CO4: Analyze endocrine system functions and behavioral physiology including reflexes and hormonal control.

Bachelor of Science (Medical) Semester–VI (Session 2026-27)

Course Title: Zoology (Animal Physiology)

Course Code: BSML-6483

(THEORY)

Max. Time: 3 Hrs.

L-T-P: 4-0-0

Max Marks: 100

Theory: 70

CA: 30

Instructions for the Paper Setter

Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections 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 will carry 12 marks.

UNIT-I

Digestion: Digestion of dietary constituents, regulation of digestive processes and absorption. Extra and intra cellular digestion, enzymatic digestion and symbiotic digestion.

Respiration: Transport of O₂ and CO₂, Oxygen dissociation curve of haemoglobin, Bohr effect, chloride (-) shift, Haldane effect and control of breathing.

UNIT-II

Heart: Origin and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, Blood pressure and micro-circulation.

Blood: Composition and functions of blood and lymph. Blood clotting. Blood groups including Rh factor, haemopoiesis and haemostasis.

Excretion: Urine formation and osmoregulation.

UNIT-III

Muscles: Ultrastructure, chemical and physical basis of skeletal muscle contraction.

Neural Integration: Structure of neuron, resting membrane potential, Origin and propagation of impulse along the axon, synapse and myoneural function.

UNIT-IV

Physiology of Behavior: Taxes and reflexes, instinctive and motivate learning and reasoning

Endocrine: Structure and physiology of thyroid, parathyroid, adrenal, hypothalamus, pituitary, pancreas and gonads.

Suggested Readings:

1. Guyton, A.S.(1994), Text Book of Medical Physiology, 7th Edition, W.B. Saunders Company.
2. Hill, R. W., Wyse, G. K. and Anderson, N. (2004), Animal physiology, Sinauer Associate, INC. Pub. Saunderland, Massachusettes, USA.
3. Hoar, W. S. (1984), General and Comparative Physiology, Prentice Hall of India Pvt. Limited, New Delhi, India.
4. Prosser, C.L. (1984), Comparative Animal Physiology, Satish Book Enterprise Books seller & Publishers, Agra.
5. Purves, W. K., Oriane, G. H., Space, H. C. and Salava, D. (2001), Life – The Science of Biology (6th ed.), Sinauer Assoc. Inc., USA.
6. Randall, D., Burggren, K.L. and French, K. (2002), Eckert Animal Physiology: Mechanisms and Adaptations, W.H. Freeman and Company, New York.

7. Taneja, S.K. (1997), Biochemistry & Animal Physiology, Trueman Book Co. Willmer, P. Stone, G. and Johnston, I (2000). Environmental Physiology of Animals, Blackwell Science.
8. Withers, P.C. (1992), Comparative Animal Physiology, Saunder College Publishing, New York.

Bachelor of Science (Medical) Semester–VI (Session 2026-27)

Course Title: Zoology (Animal Physiology Lab)

Course Code: BSMP-6483

(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: Perform basic physiological experiments such as osmosis, diffusion, and enzyme activity.

CO2: Analyze blood parameters including blood groups, haemoglobin estimation, and coagulation time.

CO3: Measure physiological variables like blood pressure and interpret results.

CO4: Conduct biochemical analysis of urine and understand excretory functions.

Bachelor of Science (Medical) Semester–VI (Session 2026-27)

Course Title: Zoology (Animal Physiology Lab)

Course Code: BSMP-6483

(Practical)

Time: 3 hrs.

L-T-P: 0-0-2

Max. Marks: 50

Practical: 35

CA: 15

Instructions for the Practical Examiners: Question paper is to set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. Demonstration of osmosis and diffusion.
2. Demonstrate the presence of amylase in saliva, denaturation by pH and temperature.
3. Determination of coagulation and bleeding time of blood in man/rat/rabbit.
4. Determination of blood groups of human blood sample.
5. Recording of blood pressure of man.
6. Analysis of urine for urea, chloride, glucose and uric acid.
7. Estimation of haemoglobin content.

(Note:- Some changes can be made in the practical depending on the availability of material.)