

  
**BANGALORE UNIVERSITY**  
DEPARTMENT OF ZOOLOGY/ APPLIED GENETICS/FORENSIC SCIENCE  
JNANA BHARATHI, BENGALURU 560 056

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**P. MAHABOOB BASHA** *M.Sc., Ph.D.,*  
**Professor & Chairman**

Chairman BOS for BSc- Zoology(UG)& BSc Genetics(UG) of  
BU/BCU/BNU

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Date: 06.07.2022

To,

The Registrar, Bangalore University, Bangalore- 560 056

Sir,

Sub: Submission of Blowup syllabus in BSc(UG) Zoology (II semester) – reg.

The generalized syllabus proposed (NEP) for II semester BSC Zoology (UG) having ambiguity in certain contents and the same is questioned by the faculty and requested to solve the complexity. Further having said that several institutions not equipped to handle the practicals of new framework of syllabus proposed in NEP. Resultantly an online BOS meeting (Google meet) was called on 29.06.2022 & 01.07.2022 during 7.00pm to 9.00pm hrs. and formulated the BLOWUP syllabus by bringing modifications (Less than 5%) pertaining to BSc II semester Zoology (UG) to be followed for the current academic year. Since, the move is aimed to benefit both students and faculty. I request you to approve and upload the BLOWUP syllabus in University website so that the institutions affiliated to BU/BCU/BNU could follow the same contents of the syllabus.

With regards,

Yours faithfully,

Sd/-

CHAIRMAN  
BOS(UG) in Zoology of BU/BCU/BNU

Copy to:

1. The Registrar, Bengaluru City University, Bengaluru 560 001
2. The Registrar, Bengaluru North University, Kolar- 563 103
3. The BOE Chairman in Zoology (UG) of BU/BCU/BNU

## BANGALORE UNIVERSITY

### PROCEEDINGS OF THE ONLINE MEETING OF THE BOS IN ZOOLOGY (UG)

A meeting of the BOS in Zoology (UG) was held by online mode on 29.06.2022 & 01.07.2022 during 7.00pm to 9.00pm hrs. to deliberate on the notified agenda pertaining to the ambiguity in B.Sc. Zoology II semester syllabus and need to prepare BLOWUP syllabus for the benefit both students and faculty.

#### **Preamble:**

The generalized syllabus proposed (NEP) for II semester BSC Zoology (UG) having ambiguity in certain contents and the same is questioned by the faculty and requested to solve the complexity. Further having said that several institutions not equipped to handle the some practicals of new framework of syllabus proposed in NEP.

#### **Resolution:**

The committee discussed the ambiguity in syllabus and formulated the BLOWUP syllabus by bringing modifications (Less than 5%) pertaining to BSc II semester Zoology (UG) to be followed for the current academic year.

Since, the move is aimed to benefit both students and faculty, the chairman, BOS(UG) was requested to communicate the University to upload the same in University website so that all institutions affiliated to BU/BCU/BNU could follow the same contents of syllabus.

#### The online meeting was attended by the following members

1. **Dr. P. MAHABOOB BASHA**, Chairman Dept. of Zoology, Bangalore University, Bangalore-560056
2. **Dr. S. SRIVATSA**, Asst. Prof of Zoology, Vijaya College, RV Road, Bangalore-560004. 9480585428.
3. **DR. GANESH U**, Asso. Prof. of Zoology MES college of Arts, Science and Commerce, Malleswaram, Bangalore-560003
4. **Mrs. N. DHANALAKSHMI** Asst. Prof of Zoology, Vijaya College, RV Road, Bangalore-560004.
5. **Dr. C.E. TRIVENI**, V.V. Pura College of Science, K. R. Road, Bangalore -560004. 9902452934. [thrivenishree@gmail.com](mailto:thrivenishree@gmail.com)
6. **Dr. C.H. ASHOKA**, Associate Prof. of Zoology, GFGC, Yelahanka, Bengaluru. 8088285777. [kashoa73@gmail.com](mailto:kashoa73@gmail.com)
7. **Dr. A. HEMALATHA**. Associate Prof. of Zoology, Maharani Cluster University, Bangalore- 560001. [12hema25@gmail.com](mailto:12hema25@gmail.com)
8. **Mr. CHANDRAPPA**, Associate Prof. of Zoology, Nrupatunga University, Bangalore- 560001. 9886884996.
9. **Dr. M. SHUBHA**, Assistant Professor in zoology, BMS College for Women, Bengaluru-560004. [shubhabhat21@gmail.com](mailto:shubhabhat21@gmail.com)
10. **Dr. ABHINANDINI**, Asso. Prof. of Zoology, GFGC, Channapatana. [abhinandini.david@gmail.com](mailto:abhinandini.david@gmail.com)
11. **Dr. BHUSHANAM**, Asso. Prof. of Zoology, Maharani Cluster University, Bangalore. [bhushanam.honey@gmail.com](mailto:bhushanam.honey@gmail.com)

**BLOWUP SYLLABUS FOR B.SC. ZOOLOGY (UG) II SEMESTER**

**FRAMED ACCORDING TO THE NATIONAL EDUCATIONAL POLICY (NEP 2020) TO IMPLEMENT FROM  
THE ACADEMIC YEAR 2021-22**

**ZOOLOGY- SEMESTER II  
CORE COURSE**

**THEORY CONTENT**

CONTENT	HOURS
<b>UNIT-1</b>	<b>14</b>
<b>Chapter 1. Structure and Function of Biomolecules:</b> <ul style="list-style-type: none"> <li>• Structure and Biological importance of carbohydrates (Monosaccharides, Disaccharides and Polysaccharides).</li> <li>• Lipids: Biological importance and definitions of saturated and unsaturated fatty acids, Tri-acyl glycerols, Phospholipids, Glycolipids and Steroids.</li> <li>• Structure, Classification and General Properties of <math>\alpha</math>-amino acids; structure of two essential (Histidine and Isoleucine) and non-essential amino acids (Glycine and Proline).</li> <li>• Levels of organization in proteins- Simple protein - definition with example and conjugate protein - definition with example.</li> </ul>	
<b>Chapter 2. Enzyme Action and Regulation</b> <ul style="list-style-type: none"> <li>• Nomenclature and classification of enzymes; Cofactors - definition with example.</li> <li>• Isozymes and Clinical use of Isozymes. Mechanism of enzyme action with specificity.</li> <li>• Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Regulation of enzyme action.</li> <li>• Equation of Michaelis-Menten, Concept of <math>K_m</math> and <math>V_{max}</math>. Enzyme inhibition- definition with two examples.</li> <li>• Allosteric enzymes definition.</li> </ul>	
<b>UNIT-2</b>	<b>14</b>
<b>Chapter 3. Metabolism of Carbohydrates and Lipids</b> <ul style="list-style-type: none"> <li>• Metabolism of Carbohydrates: glycolysis, citric acid cycle, gluconeogenesis.</li> <li>• Lipids- Biosynthesis of palmitic acid and Ketogenesis.</li> <li>• <math>\beta</math>-oxidation of saturated fatty acids with even and odd number of carbon atoms.</li> </ul>	
<b>Chapter 4. Metabolism of Proteins and Nucleotides</b> <ul style="list-style-type: none"> <li>• Catabolism of amino acids: Transamination, Deamination, Urea cycle Illustration with explanation, nucleotides and vitamins (Vitamin A).</li> <li>• Peptide linkages- definitions of di, tri and polypeptide linkage with example.</li> </ul>	
<b>Unit - 3</b>	<b>14</b>
<b>Chapter 5. Digestion and Respiration in humans</b> <ul style="list-style-type: none"> <li>• Structural organization and functions of gastrointestinal tract and associated glands.</li> <li>• Mechanical and chemical digestion of food. Absorptions of carbohydrates, lipids, proteins, and water.</li> <li>• Structure of trachea and Lung.</li> <li>• Mechanism of respiration- Inspiration and expiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood, Respiratory pigments- haemoglobin and myoglobin . Dissociation curves and the factors influencing it (pH, <math>CO_2</math> and 2,3-diphosphoglyceride).</li> </ul>	
<b>Chapter 6. Circulation and Excretion in humans</b>	

<ul style="list-style-type: none"> <li>• Components of blood and their functions.</li> <li>• Blood clotting: Blood clotting system ( Best and Tylor), Blood groups: Rh-factor, ABO and MN</li> <li>• Structure of mammalian heart Cardiac cycle; Cardiac output, Electrocardiogram, Blood pressure and its regulation</li> <li>• Structure of kidney and its functional unit; Mechanism of urine formation.</li> </ul>	
<b>Unit IV</b>	<b>14</b>
<b>Chapter 7. Nervous System and Endocrinology in humans</b>	
<ul style="list-style-type: none"> <li>• Structure of multipolar neuron, resting membrane potential (RMP)</li> <li>• Origin of action potential and its propagation across the myelinated (in detail) and unmyelinated (briefly) nerve fibers. Types of synapse (Mention chemical and electrical synapses with example).</li> <li>• Endocrine glands - pineal, pituitary, thyroid, parathyroid, pancreas and adrenal; hormones secreted by them and three functions of each.</li> <li>• Classification of hormones based on chemical nature; Mechanism of Hormone action (only lipid soluble).</li> </ul>	
<b>Chapter 8. Muscular System in humans</b>	
<ul style="list-style-type: none"> <li>• Histology of different types of muscles; Ultrastructure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch, Motor unit, summation and tetanus (minimum 3 characters).</li> </ul>	

#### ZOOLOGY SEMESTER II BLOWUP LAB CONTENT

**Note: Models to be prepared by the students and should submit during the preparatory exam (for IA marks)**

1. Preparation of models of nitrogenous bases- nucleosides and nucleotides.
2. Preparation of models of amino acids and dipeptides.
3. Preparation of models of DNA and RNA.

**Experiments to be performed by students**

4. Qualitative analysis of Carbohydrates (Molisch's test, Iodine test, Benedict's test, Selwinoff's test), Proteins (Xanthoprotein test, Biuret test, Ninhydrin test) and Lipids ( Solubility test, Sudan III test , Salkowski's test).
5. Qualitative analysis of Nitrogenous wastes – Ammonia, Urea and Uric acid.
6. Separation of amino acids by paper chromatography.
7. Determination of the activity of enzyme (Urease)-Effect of [S] and determination of Km and Vmax. (Only demonstration)
8. Determination of the activity of enzyme (Urease) - Effect of temperature and time.
9. Action of salivary amylase under optimum conditions. (Only demonstration)
10. Quantitative estimation of Oxygen consumption by fresh water Crab.
11. Quantitative estimation of salt gain and salt loss by fresh water.
12. Estimation of Hemoglobin in human blood using Sahli's haemoglobino meter.
13. Counting of RBC in blood using Hemocytometer.
14. Counting of WBC in blood using Hemocytometer.
15. Differential staining of human blood corpuscles using Leishman stain.
16. Recording of blood glucose level by using glucometer (only demonstration).

Open Elective Zoology - Parasitology		42Hrs
Content	Unit – 1	14 Hrs
<p><b>Chapter 1. General Concepts</b></p> <ul style="list-style-type: none"> <li>• Introduction, Parasites, parasitoids, host, zoonosis</li> <li>• Origin of parasites (Without any theory)</li> <li>• Basic concept of Parasitism, Symbiosis, Phoresy, commensalisms and mutualism (Definition with example)</li> <li>• Host-parasite interactions and adaptations (with reference to leech and tapeworm)</li> <li>• Occurrence, mode of infection and prophylaxis (General account)</li> </ul> <p><b>Chapter 2. Parasitic Platyhelminthes</b></p> <ul style="list-style-type: none"> <li>• Study of morphology, pathogenicity, prophylaxis and control measures of <i>Fasciolopsis buski</i>, <i>Schistosoma haematobium</i> and <i>Hymenolepis nana</i></li> <li>• Study of morphology, Life cycle, pathogenicity, prophylaxis and control measures of <i>Taenia solium</i></li> </ul> <p><b>Chapter 3. Parasitic Protists</b></p> <ul style="list-style-type: none"> <li>• Study of morphology, pathogenicity, prophylaxis and control measures of <i>Giardia intestinalis</i>, <i>Trypanosoma gambiense</i>, <i>Plasmodium vivax</i>.</li> <li>• Study of morphology, life cycle, pathogenicity, prophylaxis and control measures of <i>Entamoeba histolytica</i>.</li> </ul>		
<b>Unit – 2</b>		<b>14 Hrs</b>
<p><b>Chapter 4. Parasitic Nematodes</b></p> <ul style="list-style-type: none"> <li>• Study of morphology, pathogenicity, prophylaxis and control measures of <i>Ancylostoma duodenale</i>, <i>Wuchereria bancrofti</i>, <i>Trichinella spiralis</i></li> <li>• Study of morphology, life cycle, pathogenicity, prophylaxis and control measures of <i>Ascaris lumbricoides</i></li> <li>• Nematode plant interaction; Gall formation</li> </ul> <p><b>Chapter 5. Parasitic Arthropods</b></p> <ul style="list-style-type: none"> <li>• Biology, importance and control of Ticks (Soft tick <i>Ornithodoros</i>, Hard tick <i>Ixodes</i>), Mites (<i>Sarcoptes</i>), Lice (<i>Pediculus</i>), Flea (<i>Xenopsylla</i>), Bug (<i>Cimex</i>), Parasitoid (Wasps)</li> </ul> <p><b>Chapter 6. Parasitic Vertebrates</b></p> <ul style="list-style-type: none"> <li>• Cookicutter Shark</li> <li>• Hood Mocking bird and Vampire bat and their parasitic behavior and effect on host</li> </ul>		
<b>Unit – 3</b>		<b>14 Hrs</b>
<p><b>Chapter 7. Molecular diagnosis &amp; clinical parasitology</b></p> <ul style="list-style-type: none"> <li>• General concept of molecular diagnosis for parasitic infection</li> <li>• Advantages and disadvantages of molecular diagnosis</li> <li>• Fundamental techniques used in molecular diagnosis of endoparasites</li> <li>• Immunoassay or serological techniques for laboratory diagnosis of endoparasites on the basis of marker molecules like <i>Giardia intestinalis</i>, <i>B. coli</i>, <i>E. histolytica</i>, <i>L. donovani</i>, Malarial parasite using ELISA, RIA</li> <li>• Counter Current Immuno electrophoresis (CCI)</li> <li>• Complement Fixation Test (CFT) PCR, DNA, RNA probe</li> </ul>		

**Scheme of Practical Examination**  
**II Semester BSc. Zoology**  
**Biochemistry and Physiology**  
**Course Code: DSCC5Z00P2**

**Duration: 4 hours**

**Max. Marks: 25**

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|---------------------------------------------------------------------|------------|
| 1. Physiology/Biochemistry Experiment I (Nos 4-6 from syllabus)     | (10 marks) |
| 2. Physiology/Biochemistry Experiment II (Nos 10-11 from syllabus)  | (10 marks) |
| 3. Physiology/Biochemistry Experiment III (Nos 12-15 from syllabus) | (05 marks) |

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**Total**                      **25 marks**

**Sd/-**  
**Chairman**  
**(P. MAHABOOB BASHA)**  
**BOS in Zoology(UG)**