FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
DEPARTMENT OF MICROBIOLOGY
COURSE CURRICULUM

PART – A: Introduction				
Program: Bachelor in Life Science (Honors/ Honors with Research)		**Semester - VII**		**Session: 2024-25**
1	**Course Code**	**MBSC-07 T**		
2	**Course Title**	**Immunology**		
3	**Course Type**	**DSC**		
4	**Prerequisite (If Any)**	**As per Program**		
5	**Course Learning Outcomes (CLO)**	**At the end of this course, students will be able to –** ➢ define the functions of the immune system ➢ distinguish innate immunity and acquired immunity ➢ relate the structure and function of the molecules, cells, and organs involved in Immunity ➢ discuss cell mediated and antibody-mediated immunity ➢ explain immunological techniques		
6	**Credit Value**	**03 Credits**	**Credit = 15 Hours - Learning & Observation**	
7	**Total Marks**	**Max. Marks: 100**		**Minimum Passing marks: 40**

PART – B: Content of the Course

Total No. of Teaching-Learning Periods (01 Hr. per period) - 45 Periods (45 Hours)

Unit	**Topics (Course contents)**	**No. of Period**
I	**Immunity and Immune system –** History: Contribution of G.P. Talwar, M.C. Vaidya and Indira Nath; Concept of Innate and acquired immunity, Host defense mechanism- First, second and third line of host defense. Hematopoiesis, structure, functions and properties of Immune Cells – Stem cell, T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell, Dendritic cell; Organs of Immune; Bone Marrow, Thymus, Lymph Node, Spleen.	**12**
II	**Antigens and Antibodies-** Characteristics of an antigen (Foreignness, Molecular size and Heterogeneity); Epitopes, Haptens, Adjuvants. Structure, Types, Functions and Properties of Immunoglobulins (Antibody); Antigenic determinants on antibodies (Isotypic, allotypic, idiotypic).	**11**
III	**Immune Response -** Primary and Secondary Immune Response; Generation of Humoral Immune Response; Generation of Cell Mediated Immune Response; Killing Mechanisms by CTL (Cytotoxic T lymphocytes) and NK cells. Structure and Functions of MHC I & II molecules, Components and biological activities of Complement.	**11**
IV	**Antigen and Antibody Reactions and Immunological Techniques-** Principles of Agglutination, precipitation, Complement Fixation test, Immunodiffusion, Immuno electrophoresis, Hemagglutination, Immunofluorescence, ELISA, RIA, Coombs test.	**11**
Key Words	**Immunity, Antigens and Antibodies, Agglutination, precipitation, Innate immunity**	

Name and Signature of Convener and Members of CBoS

10.6.24 Rashmi 10.6.24 10.6.24 DR K K Pathak

10/6/24 10.6.24 10-6-24 10/6/24 Dr. Nelson Kerr

Part – C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

1. Text book of Microbiology; R. Anantharayanan, C.K. Jayaram Panikar, Orient Longman.
2. Medical microbiology; Chrakraborthy P.
3. A text book of Microbiology; Dubey & Maheshwari.
4. Immunology, A Textbook; C.V. Rao.
5. Immunology; J. Kuby.

Reference Books:

1. Fundamental Immunology; W.E. Paul.
2. Essentials of Immunology; Roitt, I.M.

Online Resources – e-Resources/ e-Books and e- learning portals

- https://repository.stikesbcm.ac.id/id/eprint/168/1/books_5453_0.pdf
- https://www.mbbcollege.in/db/notes/474.pdf
- http://www.helmberg.at/immunology.pdf
- https://www.utep.edu/eerael/immunology.htm
- https://conursing.uobaghdad.edu.iq/wp-content/uploads/sites/20/2019/09/Microbiology-L10-Immunity-and-immune-system.pdf

Part – D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: **100 Marks**
Continuous Internal Assessment (CIA): **30 Marks**
End Semester Exam (ESE): **70 Marks**

Continuous Internal Assessment (CIA): **(By Course Teacher)**	Internal Test / Quiz – **(2): 20+20** Assignment/ Seminar – **10** Total Marks – **30**	Better marks out of the two Test/ Quiz + obtained marks in Assignment shall be considered against **30** Marks
End Semester Exam (ESE):	**Two Section – A & B** Section A: **Q1.** Objective **10 X 1 = 10 Mark**; **Q2.** Short answer type – **5X4= 20 Marks** Section B: Descriptive answer type qts., **1 out of 2** from each unit – **4X10 = 40 Marks**	

Name and Signature of Convener and Members of CBoS

10.6.24 Roshni 10.6.24 10.6.24 DR-K-K-Patel Dr. Nelson Kerketta

10/6/24 10.6.24 10.6.24 10/6/24

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28)
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PART – A: Introduction

Program: Bachelor in Life Science (Honors/ Honors with Research)		Semester VII	Session: 2024-25
1	Course Code	MBSC-07 P	
2	Course Title	Lab. Course - MBSC-07	
3	Course Type	Laboratory Course	
4	Prerequisite (If Any)	As per Program	
5	Course Learning Outcomes (CLO)	At the end of this course, the student will be able to – ➢ identify blood group and estimate of haemoglobin ➢ perform Gel Diffusion assays used to examine antigen-antibody reactions ➢ perform DOT ELISA test ➢ understand the Flocculation and Agglutination reaction	
6	Credit Value	1 Credit	*Credit = 30 Hours. Laboratory or Field learning/ Training*
7	Total Marks	Max. Marks: 50	Min. Passing marks: 20

PART – B: Content of the Course

Total No. of learning-Training/ Performance Periods: 30 Periods (30 Hours)

Module	Topics (Course contents)	No. of Period
Lab./ Field Training/ Experiment contents of Course	1. Identification of human blood groups. 2. Estimation of haemoglobin. 3. Perform Total Leukocyte Count of the given blood sample. 4. Separate serum from the blood sample. 5. Flocculation reactions - VDRL Agglutination, Widal test, Blood Grouping. 7. Immuno-diffusion techniques- ODD and RID. 8. To Perform DOT ELISA. 9. Examination of skin microflora.	30
Key Words	Blood group, Hemoglobin, Serum, Agglutination, ELISA	

PART – C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

1. Practical Immunology, Frank C. Hay, Olwyn M.R. Westwood & Paul N. Nelson. 4th Edition, 1 January
2. Handbook of Practical and Clinical Immunology, 2e, Vol. II 2nd Edition, Kindle Edition
3. Immunological Techniques Interpretations Validation and Safety Measures; Ankita Joshi & R S Chauhan

Online Resources:

- https://doi.org/10.1002/9780470757475.index
- http://www.lucp.net/books-pdf/Lab%20Manual%20Dr.%20Idris%20Adewale%20Ahmed/15.%20BASIC%20IMMUNOLOGY.pdf
- https://webstor.srmist.edu.in/web_assets/downloads/2021/18BTC106J-lab-manual.pdf

PART – D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: 50 Marks
Continuous Internal Assessment (CIA): 15 Marks
End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Internal Test/ Quiz – (2): 10 & 10** **Assignment/ Seminar + Attendance: 05** **Total Marks: 15**	Better Marks out of the two Test/ Quiz + obtained marks in Assignment shall be considered against **15** Marks
End Semester Exam (ESE):	**Laboratory/ Field Skill Performance: On spot Assessment** **A. Performed the Task based on lab. work – 20 Marks** **B. Spotting based on tools & technology (written) - 10 Marks** **Viva-voce (based on principle/ technology) – 05 Marks**	**Managed by course teacher as per lab. status**

Name and Signature of Convener and Members of CBoS

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