

FACULTY OF LIFE SCIENCES

SYLLABUS

FOR

Interdisciplinary Course in Microbiology (PG)

Examinations: 2019-20



GURU NANAK DEV UNIVERSITY

AMRITSAR

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Interdisciplinary Course in Microbiology (PG)**(Odd Semester)****MCL-051: FUNDAMENTALS OF MICROBIOLOGY****Time: 3 Hrs.****Credits: 4-0-0****Max. Marks : 100****Mid Semester Marks : 20****End Semester Marks : 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage****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 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.

SECTION-A

Historical developments of microbiology scope of microbiology, Brief account of organization and classification of microorganisms. Differences between prokaryotic and eukaryotic cell. Overview of bacterial cell structure, (size, shape, arrangement membrane, cell wall, cytoplasmic inclusions, mesosomes, flagella and motility, slime, capsule, pili, chemotaxis, endospore) The brief account of fungi, structure, physiology and classification, brief account of virus (bacteriophages) structure, life cycle (lytic and lysogenic).

SECTION-B

Reproduction and Growth: Life cycles of representative microorganisms including bacteria, fungi and viruses, population growth and its measurement, effect of environmental condition on growth pH, temp. aeration etc, continuous culture, diauxic, synchronous growth cultures and anaerobic cultures.

SECTION-C

Microscopy: Principles and applications in microbiology, brightfield microscopy, darkfield microscopy, fluorescence and immunofluorescence microscopy, phase contrast and electron (transmission and scanning) microscopy. Staining of microorganisms.

SECTION-D

Control of Microorganisms: Control of microbes by physical and chemical agents. Antibiotics, properties and mode of action; Drug resistance and its significance. Antibiotic sensitivity test. Industrial uses of bacteria yeast & molds.

Books Recommended:

1. Stanier, R.Y. Adelberg, E.A. and Ingraham, J.L. (1984), General Microbiology, IV edn. Mac Millan Press.
2. Pelczar, M.J. Chan, E.C.S. and Krieg, N.R. (1986), Microbiology, V Ed. Mc Graw Hill.
3. Prescott. L.M. Harley J.P. and L. Kreig D.A. (1990). Microbiology, WCB Publishers.
4. Rosenberg, E & Cohen I.R. (1983). Microbial Biology. H.S. International Editions.

Interdisciplinary Course in Microbiology (PG)**(Even Semester)****MCL-052: CONCEPTS IN MICROBIAL GENETICS****Time: 3 Hrs.****Credits: 4-0-0****Max. Marks : 100****Mid Semester Marks : 20****End Semester Marks : 80****Mid Semester Examination: 20% weightage****End Semester Examination: 80% weightage****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 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.

SECTION-A

Salient differences between organization and expression of prokaryotic and eukaryotic genomes.

SECTION-B

Isolation of mutants and their significance, fluctuation test, concept of linkage and multifactor crosses, complementation, Reversion and suppression.

SECTION-C

Generalized recombination and transposition. Brief account of Bacterial Transformation, Conjugation and Transduction: their significance in microbial and molecular genetics.

SECTION-D

Bacteriophages and their properties, Phage and its lytic/lysogenic switch. Types of bacterial plasmids and their distribution in different microbial groups

Books Recommended:

1. Friefelder, D., Maloy, S.R. and Cronan, J.E. 1994. Microbial Genetics, IInd Edition. Jones and Barlett Publishers.
2. Genes IX, Lewin, Benjamin 2007, CBS Publishers and Distributors
3. Malacinski, G.M. & Friefelder, D. 1993. Essentials of Molecular Biology, IInd Edition. Jones and Bartleet Publishers.
4. Synder, L. and Champness W. 1997. Molecular Genetics of Bacteria, ASM Press.
5. Stent G.S. & Calender, R. 1986. Molecular Genetics 2nd Edition, CDS Publishers.