

# **MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester V)

**Class :** B.Sc

**Section:** Mb.G.C

**Course/Paper:** Medical microbiology-5

**Unit:** I

**No. of Hours Allotted:** 12

| <b>Topics to be covered</b>                   | <b>No. of Hours</b> |
|---|---------------------|
| History of medical microbiology               | 1                   |
| General principles of Diagnostic microbiology | 1                   |
| Collection of Clinical samples                | 1                   |
| Transport of clinical samples                 | 1                   |
| Processing of clinical samples                | 1                   |
| General methods of laboratory Diagnosis       | 1                   |
| Cultural methods                              | 1                   |
| Biochemical methods                           | 1                   |
| Serological methods                           | 1                   |
| Molecular methods                             | 1                   |
| Normal flora of human body                    | 2                   |
| Properties of pathogenic Microorganisms       | 1                   |

Name of the Teacher: A.Chetana

Head, Department of Microbiology

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester I)

Class :B.Sc I Year

Section: Mb.G.C

Course/Paper: General Microbiology-1

Unit: I

No. of Hours Allotted: 15

| Topics to be covered   | No. of Hours |
|--|--------------|
| Scope and Importance of Microbiology.                              | 2            |
| Different branches of Microbiology                                 | 2            |
| Importance of Microorganisms in human welfare                      | 2            |
| Spontaneous generation – biogenesis theory germ theory of diseases | 2            |
| Development of microbiology in 20 <sup>th</sup> century.           | 2            |
| Important contributions of Leeuwenhoek, Louis Pasteur.             | 1            |
| Robertkoch, Edward jenner, Iwanowsky.                              | 2            |
| Beizerinck, Winogradsky to microbiology.                           | 2            |

Name of the Teacher: A.Chetana  
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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester I)**

**Class :** B.Sc I Year  
Mb.G.C

**Section:**

**Course/Paper:** General Microbiology-1

**Unit:** II

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                        | <b>No. of Hours</b> |
|--|---------------------|
| Principles of microscopy-bright field, fluorescent | 2                   |
| Dark field , Phase contrast                        | 2                   |
| Electron microscopy (SEM & TEM)                    | 2                   |
| Microbial staining- simple, differential.          | 2                   |
| Negative, Spore and Acid fast staining techniques  | 2                   |
| Sterilization methods- Physical methods            | 1                   |
| Autoclaving, hot air oven, filtration, Radiation   | 2                   |
| Chemical methods                                   | 2                   |

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester I)**

**Class :** B.Sc I Year

**Section:** Mb.G.C

**Course/Paper:** General Microbiology-1

**Unit:** III

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>        | <b>No. of Hours</b> |
|------------------------------------|---------------------|
| Morphology of bacterial cell       | 2                   |
| UltraStructure of bacterial cell   | 2                   |
| Gram positive bacterial cell       | 2                   |
| Gram negative bacterial cell       | 2                   |
| Structures outside cell membrane   | 2                   |
| Capsule, Flagella                  | 1                   |
| Pili, cell wall & cell membrane    | 1                   |
| Components within cell membrane    | 1                   |
| Nucleoid, cytoplasm                | 1                   |
| Ribosomes, Mesosomes, cytoskeleton | 1                   |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester I)**

**Class :** B.Sc I Year

**Section:** Mb.G.C

**Course/Paper:** General Microbiology-1

**Unit:** IV

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                        | <b>No. of Hours</b> |
|--|---------------------|
| Characterization of microorganisms                 | 1                   |
| Morphology, Cultural characters                    | 2                   |
| Biochemical, Metabolic, Antigenic characters       | 1                   |
| Molecular, Pathogenic, ecological characters       | 1                   |
| FAMS Membrane fatty acids                          | 1                   |
| Outlines of bacterial classification               | 1                   |
| Bergeys manual of Systematic Bacteriology          | 1                   |
| Important characters of special groups of bacteria | 1                   |
| Mycoplasma   | 1                   |
| Rickettsiae  | 1                   |
| Chlamydiae   | 1                   |
| Actinomyces  | 1                   |
| Cyanobacteria                                      | 1                   |
| Archaea bacteria                                   | <b>1</b>            |

Name of the Teacher: Dr.Chand Pasha  
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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester II)**

**Class:** B. Sc I Year

**Section:** Microbiology

**Course/Paper:** II- Microbial Biochemistry and Metabolism

**Unit I:** Biochemistry of Biomolecules

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                           | <b>No. of Hours</b> |
|---|---------------------|
| Biomolecules of Microorganisms                        | 1                   |
| General Characteristics of Carbohydrates              | 2                   |
| Monosaccharides                                       | 1                   |
| Disaccharides   | 1                   |
| Polysaccharides                                       | 1                   |
| General Characteristics of Amino acids                | 2                   |
| General Characteristics of Proteins                   | 1                   |
| General Characteristics of Fatty acids (saturated)    | 1                   |
| General Characteristics of Fatty acids (Un-saturated) | 1                   |
| General Characteristics of Lipids                     | 1                   |
| Sphingo Lipids, Sterols, Phospholipids                | 1                   |
| Structure of peptidoglycan                            | 1                   |
| Synthesis of peptidoglycan                            | 1                   |
|   | <b>15hrs</b>        |

Name of the Teacher: Dr. Shaik Naseeruddin

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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester II)**

**Class:** B. Sc I Year

**Section:** Microbiology

**Course/Paper:** II- Microbial Biochemistry and Metabolism

**Unit II:** Biochemistry of Metabolism

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                           | <b>No. of Hours</b> |
|---|---------------------|
| Hydrogen ion concentration in biological fluids       | 2                   |
| pH measurement  | 1                   |
| Types of buffer                                       | 1                   |
| Uses of buffer in biological reactions                | 1                   |
| Enzymes Introduction, enzyme unit                     | 1                   |
| Enzymes properties and classification                 | 2                   |
| Biocatalysis – Induced fit model                      | 1                   |
| Biocatalysis – lock and key model                     | 1                   |
| co –enzymes and co factors                            | 1                   |
| Inhibition of enzyme activity – competitive           | 1                   |
| Inhibition of enzyme activity – non-competitive       | 1                   |
| Inhibition of enzyme activity – un-competitive        | 1                   |
| Inhibition of enzyme activity – allosteric inhibition | 1                   |
|   | <b>15hrs</b>        |

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester II)**

**Class :** B.ScI Year

**Section:** Mb.G.C

**Course/Paper:** Microbial Biochemistry & Metabolism-2

**Unit:** III

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                              | <b>No. of Hours</b> |
|--|---------------------|
| Nutritional types of bacteria                            | 2                   |
| Photoautotrophs  | 1                   |
| Chemoautotrophs  | 2                   |
| Chemoheterotrophs  | 2                   |
| Acetogens  | 2                   |
| Methanogens  | 1                   |
| Microbial Culture media                                  | 1                   |
| Types of Media-Natural, Semisynthetic media              | 1                   |
| Synthetic media, Selective media                         | 1                   |
| Differential media, Enrichment media and Transport media | 1                   |
| Bacterial photosynthesis                                 | 1                   |

Name of the Teacher: A. chetana  
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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester II)**

**Class :B.Sc**

**Section: Mb.G.C**

**Course/Paper: Microbial Biochemistry & Metabolism-2**

**Unit: IV**

**No. of Hours Allotted: 15**

| <b>Topics to be covered</b>                                     | <b>No. of Hours</b> |
|---|---------------------|
| Bacterial Growth  | 2                   |
| Growth curve- Lag, Log/Exponential, Stationary and Death Phases | 1                   |
| Factors affecting bacterial Growth                              | 2                   |
| Continous Growth  | 2                   |
| Synchronous Growth  | 2                   |
| Measurement of Bacterial Growth                                 | 1                   |
| Sporulation in bacteria   | 1                   |
| Isolation of Pure cultures                                      | 1                   |
| Maintainance of pure cultures                                   | 2                   |
| Preservation of Microbial Cultures                              | 1                   |
|   | 15 hrs              |

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester III)

**Class :** B.Sc II Year

**Section:** Mb.G.C

**Course/Paper:** Virology and Immunology-3

**Unit:** I

**No. of Hours Allotted:** 15

| Topics to be covered  | No. of Hours |
|---|--------------|
| Discovery of viruses  | 2            |
| Nature of viruses.  | 1            |
| Biological, physical and Biochemical properties of viruses        | 2            |
| Nomenclature of viruses   | 2            |
| Classification of viruses as per ICTV                             | 2            |
| Cultivation and assay of bacteriophages, plant and animal viruses | 1            |
| General methods of viral replication                              | 1            |
| Lytic cycle   | 1            |
| Lysogenic cycle   | 1            |
| Morphology, Structure and multiplication of TMV                   | 1            |
| Structure and multiplication of HIV                               | 1            |
|   | 15 hrs       |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester II)**

**Class :** B.sc II Year

**Section: Mb.G.C**

**Course/Paper:** Virology and Immunology-3

**Unit:** II

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                                 | <b>No. of Hours</b> |
|---|---------------------|
| History of Immunology.                                      | 2                   |
| Development of Immunology                                   | 2                   |
| Types of Immunity-Innate Immunity                           | 2                   |
| Aquired Immunity  | 2                   |
| Active and Passive Immunity                                 | 2                   |
| Humoral and cell mediated Immunity                          | 2                   |
| Primary organs of Immune system-Thymus, Bone marrow etc.    | 1                   |
| Secondary organs of Immune system- Lymph nodes, Spleen etc. | 2                   |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)**

**Class :** B.Sc II Year

**Section:** Mb.G.C

**Course/Paper:** Virology and Immunology-3

**Unit:** III

**No. of Hours Allotted:**15

| <b>Topics to be covered</b>             | <b>No. of Hours</b> |
|---|---------------------|
| Cells of Immune system                  | 1                   |
| B and T Lymphocytes                     | 1                   |
| Null cells, Monocytes, Macrophages      | 2                   |
| Neutrophils, Basophils and Eosinophils. | 1                   |
| Antigens-Types                          | 2                   |
| Chemical nature of antigens             | 1                   |
| Antigenic Determinants, Haptens         | 1                   |
| Factors affecting antigenicity          | 2                   |
| Antibodies                              | 1                   |
| Basic structure of antibodies           | 1                   |
| Types and properties of antibodies      | 1                   |
| Functions of Immunoglobulins            | 1                   |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)**

**Class :B.Sc II year**

**Section: Mb.G.C**

**Course/Paper: Virology and Immunology-3**

**Unit: IV**

**No. of Hours Allotted: 15**

| <b>Topics to be covered</b>                      | <b>No. of Hours</b> |
|--|---------------------|
| Types of antigen antibody reactions-Introduction | 1                   |
| Agglutination                                    | 1                   |
| Blood Groups                                     | 1                   |
| Precipitation                                    | 1                   |
| Neutarlization                                   | 1                   |
| Complement fixation                              | 1                   |
| Labelled antibody based techniques- ELISA        | 1                   |
| RIA  | 1                   |
| Immunofluorescence                               | 1                   |
| Types of Hypersensitivity                        | 1                   |
| Autoimmunity and its significance                | 1                   |
| Preventive control of Diseases                   | 1                   |
| Active and Passive Immunization                  | 1                   |
| Vaccines   | 1                   |
| Natural vaccines & Recombinant vaccines          | 1                   |
|  |                     |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)**

**Class :** B.Sc II year

**Section:** Mb.G.C

**Course/Paper:** Food and Agricultural microbiology-4

**Unit: I**

**No. of Hours Allotted: 15**

| <b>Topics to be covered</b>                                      | <b>No. of Hours</b> |
|--|---------------------|
| Microorganisms of food spoilage and their sources                | 1                   |
| Spoilage of different food materials                             | 1                   |
| Spoilage of different food materials-Fruits and vegetables       | 1                   |
| Spoilage of different food materials-Meat, fish                  | 1                   |
| Spoilage of different food materials-Canned foods                | 1                   |
| Food intoxication-Botulinum                                      | 2                   |
| Food intoxication-Staphylococcal food poisoning                  | 2                   |
| Food borne Diseases- Salmonellosis                               | 2                   |
| Food borne Diseases-Shigellosis                                  | 2                   |
| Food borne Diseases- Salmonellosis-Development and its Detection | 1                   |
| Food borne Diseases-Shigellosis- Development and its Detection   | 1                   |

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester II)**

**Class :** B.Sc II year

**Section:** Mb.G.C

**Course/Paper:** Food and Agricultural microbiology-4

**Unit: II**

**No. of Hours Allotted: 15**

| <b>Topics to be covered</b>                                   | <b>No. of Hours</b> |
|---|---------------------|
| General account of food preservation                          | 1                   |
| Different methods of food preservation                        | 3                   |
| Microbiological production of food and dairy products         | 2                   |
| Microbiological production of food and dairy products-Bread   | 2                   |
| Microbiological production of food and dairy products-cheese  | 1                   |
| Microbiological production of food and dairy products-Yoghurt | 1                   |
| Concept of Probiotics   | 2                   |
| Microbial flora of milk                                       | 1                   |
| Microbial flora of milk products                              | 1                   |
| Pasteurization of milk  | 1                   |

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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester IV)**

**Class:** B. Sc II Year

**Section:** Microbiology

**Course/Paper:** IV- Food and Agricultural Microbiology

**Unit III:** Environmental Microbiology

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>               | <b>No. of Hours</b> |
|---|---------------------|
| Microbiology of potable water             | 1                   |
| Microbiology of polluted water            | 1                   |
| Sanitary quality of potable water         | 1                   |
| Primary Sewage treatment                  | 1                   |
| Secondary Sewage treatment                | 1                   |
| Tertiary Sewage treatment                 | 1                   |
| Microorganisms of environment – Soil      | 2                   |
| Microorganisms of environment – water     | 2                   |
| Microorganisms of environment – Air       | 2                   |
| Microbial Decomposition of Organic matter | 1                   |
| Carbon cycle                              | 1                   |
| Nitrogen cycle                            | 1                   |
|   | <b>15 hrs</b>       |

Name of the Teacher: Dr. Shaik Naseeruddin

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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester IV)**

**Class:** B. Sc II Year

**Section:** Microbiology

**Course/Paper:** IV- Food and Agricultural Microbiology

**Unit IV:** Environmental Microbiology

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                | <b>No. of Hours</b> |
|--|---------------------|
| Microorganisms in relation to plant growth | 1                   |
| Rhizosphere                                | 1                   |
| Phyllosphere                               | 1                   |
| Plant Growth promoting microorganisms      | 1                   |
| Nitrogen fixation                          | 1                   |
| Symbiotic nitrogen fixation                | 2                   |
| Non- Symbiotic nitrogen fixation           | 2                   |
| Biofertilizers                             | 2                   |
| Biological control of plant diseases       | 2                   |
| Biopesticides                              | 2                   |
|  |                     |
|  |                     |
|  | <b>15 hrs</b>       |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester V)**

**Class : B.Sc**

**Section: Mb.G.C**

**Course/Paper:** Medical microbiology-5

**Unit: I**

**No. of Hours Allotted: 12**

| <b>Topics to be covered</b>                   | <b>No. of Hours</b> |
|---|---------------------|
| History of medical microbiology               | 1                   |
| General principles of Diagnostic microbiology | 1                   |
| Collection of Clinical samples                | 1                   |
| Transport of clinical samples                 | 1                   |
| Processing of clinical samples                | 1                   |
| General methods of laboratory Diagnosis       | 1                   |
| Cultural methods                              | 1                   |
| Biochemical methods                           | 1                   |
| Serological methods                           | 1                   |
| Molecular methods                             | 1                   |
| Normal flora of human body                    | 2                   |
| Properties of pathogenic Microorganisms       | 1                   |

Name of the Teacher: A.Chetana  
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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester V)**

**Class :** B.Sc

**Section:** Mb.G.C

**Course/Paper:** Medical microbiology-5

**Unit:** II

**No. of Hours Allotted:** 12

| Topics to be covered                 | No. of Hours |
|--------------------------------------|--------------|
| Definition of Infection              | 1            |
| Types of Infection                   | 1            |
| Non-specific defense mechanism       | 1            |
| Mechanical barriers                  | 1            |
| Antagonism of indigenous flora       | 1            |
| Anti-bacterial substances            | 1            |
| Anti-bacterial substances-Lysozyme   | 1            |
| Anti-bacterial substances-Complement | 1            |
| Anti-bacterial substances-properdin  | 1            |
| Antiviral substances                 | 1            |
| Antiviral substances-Interferons     | 1            |
| Antiviral substances-Base analogues  | 1            |
| Phagocytosis                         | 1            |

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester V)**

**Class : B.Sc**

**Section: Mb.G.C**

**Course/Paper:** Medical microbiology-5

**Unit: III**

**No. of Hours Allotted:11**

| <b>Topics to be covered</b>                | <b>No. of Hours</b> |
|--|---------------------|
| Bacterial Toxins                           | 1                   |
| Virulence                                  | 1                   |
| Attenuation                                | 1                   |
| Air borne diseases                         | 1                   |
| Air borne diseases – Tuberculosis          | 1                   |
| Air borne diseases – Influenza             | 1                   |
| Food and water borne diseases – Cholera    | 2                   |
| Food and water borne diseases – Typhoid    | 1                   |
| Food and water borne diseases – Amoebiasis | 2                   |
|  |                     |
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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
**LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester V)**

**Class : B.Sc**

**Section: Mb.G.C**

**Course/Paper:** Medical microbiology-5

**Unit: IV**

**No. of Hours Allotted: 10**

| <b>Topics to be covered</b>           | <b>No. of Hours</b> |
|---------------------------------------|---------------------|
| Insect borne diseases – Malaria       | 1                   |
| Insect borne diseases – Dengue fever  | 1                   |
| Contact diseases- Syphilis            | 2                   |
| Zoonotic Diseases- Rabies             | 2                   |
| Zoonotic Diseases- Anthrax            | 1                   |
| Blood borne Diseases- Serum Hepatitis | 2                   |
| Blood borne Diseases- AIDS            | 1                   |
|                                       |                     |
|                                       |                     |
|                                       |                     |
|                                       |                     |
|                                       |                     |
|                                       |                     |
|                                       |                     |

Name of the Teacher: A.Chetana  
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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester V)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** Recombinant DNA technology

**Unit I:**

**No. of Hours Allotted:** 12

| <b>Topics to be covered</b>             | <b>No. of Hours</b> |
|---|---------------------|
| Techniques & enzymes in rDNA technology | 1                   |
| Restriction digestion                   | 1                   |
| Ligation                                | 1                   |
| Transformation                          | 1                   |
| Restriction endonucleases               | 1                   |
| DNA ligases                             | 1                   |
| Properties & Specificity                | 1                   |
| S1 nuclease                             | 1                   |
| DNA polymerase                          | 1                   |
| Polynucleotide kinase                   | 1                   |
| Phosphatase                             | 1                   |
| Reverse transcriptase                   | 1                   |
|   | <b>12 hrs</b>       |

Name of the Teacher: Dr. Chand Pasha  
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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester V)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** Recombinant DNA technology

**Unit II:**

**No. of Hours Allotted:** 11

| <b>Topics to be covered</b> | <b>No. of Hours</b> |
|-----------------------------|---------------------|
| Plasmids                    | 1                   |
| Plasmids Incompatibility    | 1                   |
| Isolation & purification    | 2                   |
| Plasmid vectors             | 1                   |
| PBR 322                     | 1                   |
| Single stranded plasmids    | 1                   |
| Cosmids                     | 1                   |
| Phagemids                   | 1                   |
| Lambda vectors              | 1                   |
| M13 vectors                 | 1                   |
|                             |                     |
|                             |                     |
|                             | <b>11 hrs</b>       |

Name of the Teacher: Dr. Chand Pasha

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester V)**

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** Recombinant DNA technology

**Unit III:**

**No. of Hours Allotted: 10**

| <b>Topics to be covered</b>    | <b>No. of Hours</b> |
|--------------------------------|---------------------|
| Specialized cloning strategies | 2                   |
| Expression vectors             | 1                   |
| Library construction vectors   | 1                   |
| DNA libraries                  | 1                   |
| cDNA libraries                 | 1                   |
| Shot gun cloning               | 1                   |
| Directed cloning               | 1                   |
| Phage display                  | 1                   |
| Chromosomal integration        | 1                   |
|                                |                     |
|                                |                     |
|                                |                     |
|                                |                     |
|                                | <b>10 hrs</b>       |

Name of the Teacher: Dr.Chand Pasha

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**LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester IV)**

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** Microbiology

**Unit IV:**

**No. of Hours Allotted:** 12

| <b>Topics to be covered</b> | <b>No. of Hours</b> |
|-----------------------------|---------------------|
| PCR methods                 | 1                   |
| Applications of PCR         | 1                   |
| Normal PCR                  | 1                   |
| Gradient PCR                | 1                   |
| Reverse Transcriptase PCR   | 1                   |
| Electrophoresis             | 1                   |
| SDS                         | 1                   |
| PAGE                        | 1                   |
| Agarose gel electrophoresis | 1                   |
| Chromatography              | 1                   |
| Paper chromatography, TLC   | 1                   |
| Centrifugation methods      | 1                   |

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester VI)

**Class :** B.Sc

**Section:** Mb.G.C

**Course/Paper:** Pharmaceutical microbiology-7

**Unit:** I

**No. of Hours Allotted:** 12

| <b>Topics to be covered</b>                                     | <b>No. of Hours</b> |
|---|---------------------|
| Types of microorganisms in Pharmaceutical products              | 1                   |
| Types of microorganisms in Pharmaceutical products and industry | 2                   |
| Microbiological spoilage  | 1                   |
| Microbiological spoilage prevention of pharmaceutical products  | 2                   |
| Antimicrobial agents  | 2                   |
| Antimicrobial agents used as preservatives                      | 2                   |
| Evaluation of Microbial stability of formulation                | 2                   |

12 hrs

Name of the Teacher: A.Chetana  
Department of  
Signature:

Head,  
Signature:

**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester VI)

**Class :** B.Sc

**Section:** Mb.G.C

**Course/Paper:** Pharmaceutical microbiology-7

**Unit:** II

**No. of Hours Allotted:** 12

| <b>Topics to be covered</b>                                 | <b>No. of Hours</b> |
|---|---------------------|
| Antimicrobial agents- Bacteriostatic agents                 | 1                   |
| Antimicrobial agents- Bactericidal agents                   | 1                   |
| Factors affecting antimicrobial activity                    | 1                   |
| Non medicinal antimicrobial agents                          | 1                   |
| Non medicinal antimicrobial agents- sanitizers              | 1                   |
| Disinfectants, antiseptics                                  | 1                   |
| Antimicrobial action of phenols, Phenolic compounds,        | 1                   |
| Alcohols, Halogens, Heavy metals                            | 1                   |
| Dyes, aldehydes, Detergents                                 | 1                   |
| Medicinal antimicrobial agents                              | 1                   |
| History of Chemotherapy –Paul Ehrlich and his contributions | 1                   |
| Selective toxicity  | 1                   |
| Target sites of drug action in microbes                     | 1                   |

12 hrs

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester VI)

**Class :** B.Sc III Year

**Section:** Mb.G.C

**Course/Paper:** Pharmaceutical microbiology-7

**Unit:** III

**No. of Hours Allotted:**11

| <b>Topics to be covered</b>                     | <b>No. of Hours</b> |
|---|---------------------|
| Antibiotics- Origin, development and definition | 1                   |
| Mode of action of important drugs               | 1                   |
| Cell wall inhibitors                            | 1                   |
| Cell membrane inhibitors                        | 1                   |
| Macromolecular synthesis inhibitors             | 1                   |
| Metabolite analogues                            | 2                   |
| Antifungal antibiotics                          | 2                   |
| Anti viral agents                               | 2                   |

11 hrs

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**NIZAM COLLEGE : DEPARTMENT OF MICROBIOLOGY**  
LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester VI)

**Class :** B.Sc

**Section:** Mb.G.C

**Course/Paper:** Pharmaceutical microbiology-7

**Unit:** IV

**No. of Hours Allotted:** 12

| Topics to be covered                    | No. of Hours |
|---|--------------|
| Microbiological assays                  | 1            |
| Assay for growth inhibiting substances  | 1            |
| Assay for non medicinal antimicrobials  | 1            |
| Drug sensitivity testing methods        | 1            |
| Assay for antibiotics                   | 1            |
| Determination of MIC                    | 1            |
| Liquid, solid tube agar assay           | 1            |
| Agar plate assay                        | 1            |
| Drug Resistance                         | 1            |
| Clinical basis of drug Resistance       | 1            |
| Biochemistry of drug Resistance         | 1            |
| Genetics of Drug Resistance in bacteria | 1            |
|   | 12 hrs       |

Name of the Teacher: A.Chetana  
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**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2017-2018 (Semester VI)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** VIII- Industrial Microbiology

**Unit I:** History of Industrial Microbiology

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                             | <b>No. of Hours</b> |
|---|---------------------|
| Introduction to industrial microbiology                 | 1                   |
| History of industrial Microbiology                      | 2                   |
| Scope of industrial Microbiology                        | 2                   |
| Microorganisms of industrial importance                 | 1                   |
| Microorganisms of industrial importance – Bacteria      | 2                   |
| Microorganisms of industrial importance – Actinomycetes | 2                   |
| Microorganisms of industrial importance – Yeasts        | 2                   |
| Microorganisms of industrial importance – Moulds        | 2                   |
| Exploitation of Microorganisms in industry              | 1                   |
|   | <b>15hrs</b>        |

Name of the Teacher: Dr. Shaik Naseeruddin

Head, Department of Microbiology

Signature:

Signature:

**NIZAM COLLEGE: DEPARTMENT OF MICROBIOLOGY**

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester VI)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** VIII- Industrial Microbiology

**Unit II:** Upstream processing

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>                             | <b>No. of Hours</b> |
|---|---------------------|
| Screening and isolation of industrially useful microbes | 2                   |
| Strain improvement                                      | 3                   |
| Raw materials   | 2                   |
| Fermentation media                                      | 2                   |
| Types of Fermentation – aerobic, anaerobic              | 1                   |
| Batch and continuous fermentation                       | 2                   |
| Submerged fermentation                                  | 1                   |
| Surface fermentation                                    | 1                   |
| Solid state fermentation                                | 1                   |
|   | <b>15hrs</b>        |

Name of the Teacher: Dr. Shaik Naseeruddin

Head, Department of Microbiology

Signature:

Signature:

LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester VI)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** VIII- Industrial Microbiology

**Unit III:** Fermentor and downstream processing

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>  | <b>No. of Hours</b> |
|--|---------------------|
| Detection and assay of fermentation products   | 1                   |
| Physiochemical methods   | 3                   |
| Biological assays  | 3                   |
| Fermentation equipment and its use   | 2                   |
| Design of fermentor  | 2                   |
| Type of fermenter  | 2                   |
| Control of fermentation parameters – aeration, agitation, antifoam, pH and temperature | 2                   |
|  | <b>15hrs</b>        |

Name of the Teacher: Dr. Shaik Naseeruddin

Head, Department of Microbiology

Signature:

Signature:



LESSON PLAN FOR THE ACADEMIC YEAR 2018-2019 (Semester VI)

**Class:** B. Sc III Year

**Section:** Microbiology

**Course/Paper:** VIII- Industrial Microbiology

**Unit IV:** Industrial production

**No. of Hours Allotted:** 15

| <b>Topics to be covered</b>   | <b>No. of Hours</b> |
|---|---------------------|
| Industrial production (Microorganisms, Media, Fermentation, Product recovery) |                     |
| A. Alcohols – Ethyl alcohol   | 3                   |
| B. Beverages – Beer   | 2                   |
| C. Enzymes – Amylases   | 3                   |
| D. Antibiotics – Penicillin   | 3                   |
| E. Amino acids – Glutamic acid  | 2                   |
| F. Vitamins – B12   | 2                   |
|   | <b>15hrs</b>        |

Name of the Teacher: Dr. Shaik Naseeruddin

Head, Department of Microbiology

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Signature: