**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristic of Platyhelminthes | Discussion about the general morphology and anatomy of platyhelminthes. | Students will know about the general bouplan of platyhelminthes. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Classification of platyhelmithes upto classes | Classify each class with salient characters. | Students will know and differentiate each class with suitable example. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristics of *Fasciola hepatica* | Discussion about the general morphology and basic anatomy of *Fasciola hepatica*. | Students will know about the general bouplan of *Fasciola hepatica.*. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Life Cycle of *Fasciola hepatica* | Description of the life cycle with proper diagram. | Student will know about the life cycle and mechanism of infection by *Fasciola hepatica.* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristic of *Taenia solium* | Discussion about the general morphology and basic anatomy of *Taenia solium* | Students will know about the general bouplan of *Taenia solium.* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Life cycle of *Taenia solium* | Description of the life cycle with proper diagram. | Student will know about the life cycle and mechanism of infection by *Taenia solium.* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristic of nematoda | Discussion about the general morphology and anatomy of nematoda. | Students will know about the general bouplan of nematoda. |

Signature of teacher

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Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Classification of nematode upto classes | Classify each class with salient characters. | Students will know and differentiate each class with suitable example. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristic of *Ascaris lumbricides* | Discussion about the general morphology and basic anatomy of *Ascaris lumbricides* | Students will know about the general bouplan of *Ascaris lumbricides* . |

Signature of teacher

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Life cycle of *Ascaris lumbricides* | Description of the life cycle with proper diagram. | Student will know about the life cycle and mechanism of infection by *Ascaris lumbricides*. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  General characteristic of *Wuchereria brancrofti* | Discussion about the general morphology and basic anatomy of *Wuchereria brancrofti.* | Students will know about the general bouplan of *Wuchereria brancrofti.* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Life cycle of *Wuchereria brancrofti* | Description of the life cycle with proper diagram. | Student will know about the life cycle and mechanism of infection by *Wuchereria brancrofti.* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T1 –Non-Chordates I**  Parasitic adaptations of helminthes | Discussion about the adaptations related to parasitic mode of life. | Students will know about how the helminthes can survive within the host species. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  General characteristic of Annelida | Discussion about the general morphology and basic anatomy of annelida | Students will know about the general bouplan of annelid. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Classification of annelida upto classes | Classify each class with salient characters. | Students will know and differentiate each class with suitable example. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  General excretion process in annelida | Briefly description of excretion process of annelida | Students will learn about the process of annelids and how it differs from other groups. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Structure and variation of nephridia | Diagrammatic description of nephridia | Students will know the basic structure of nephridia |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Excretion in annelid through nephidia | Detail process of excretion through nephridia | Students will know about the excretion process of annelid through nephridia |

Signature of teacher

**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  General morphology of *Nereis* | Basic bauplan of *Nereis.* | Students will learned about the basic morphological features of *Nereis.* |

Signature of teacher

**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Locomotion in *Nereis* | Diagrammatical description of locomotion. | Student will know about the locomotion process of *Nereis* and also basic locomotion process of annelid. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Metamerism: Definition and concept. | Brief concept of metamerism | Student will know the definition and the idea about metamerism. |

Signature of teacher

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Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Different types of metemerism. | Description of each types with suitable characters and example. | Students will know about the types and which organisms belong into which type. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T3 - Non-Chordates II**  Theories regarding evolution of metemerism | Description of each theory with proper evolutionary significance. | Students will know about the evolution of metemerism and how and why metamerism evolve. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Structure and Functions: Endoplasmic Reticulum | To familiarise the students with the Structure and Functions of: Endoplasmic Reticulum | Students will know about the structure and function of endoplasmic reticulum. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Structure and Functions: Golgi apparatus | To familiarise the students with the Structure and Functions of: Golgi apparatus | Students will know about the structure and function of Golgi apparatus |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Structure and Functions: Lysosomes | To familiarise the students with the Structure and Functions of: Lysosomes | Students will know about the structure and function of Lysosomes |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Protein sorting mechanisms | To understand the Protein sorting mechanisms. | Students will know about how the protein trafficking occurs into the cell. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Mechanisms of vesicular transport | To understand the vesicular mechanisms. | Students will know about how the protein transport occurs via vesicles into the cell. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Mitochondria Structure and Function | To understand the Mitochondria Structure | Student will have a clear cut idea about mitochondria structure and function. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Semi-autonomous nature, Endosymbiotic hypothesis | To understand Semi-autonomous nature, Endosymbiotic hypothesis, Mitochondrial origin. | Students will have a basic concept regarding the orihin and evolution of mitochondria. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  MitochondrialRespiratory Chain | To have a idea about the Respiratory Chain and description with suitable diagram. | Students have a glance of respiratory chain and electron transport mechanism through mitochondria. |

Signature of teacher

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Chemi-osmotic hypothesis | To have a idea about the chemiosmotic hyppothesis and description with suitable diagram. | Students have a clear cut knowledge about the hypothesis and model of electron transport mechanism through mitochondrial membrane. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Peroxisomes: Structure and Functions | Description of the structure and function of peroxosomes.  Several enzymes involves in peroxosomal function. | Students will have a clearcut focus about the detailed architecture and functioning of peroxosomes. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T4 - Cell Biology**  Centrosome: Structure and Functions | Description of the structure and function of Centrosome. | Students will have a clear cut focus about the detailed architecture and functioning of Centrosome. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Principles of inheritance | The basic principles and history | Students will know about the principles of inheritance |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Incomplete dominance | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Co dominance | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Epistasis | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Multiple allele | Definition, Description with example | They will know about the process and example |

Signature of teacher

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Lethal allele | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Pleiotropy | Definition, Description with example | They will know about the process and example |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Sex linked inheritance | Definition, Description with example | They will know about the process and example |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Sex influenced and sex limited inheritance | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Polygenic inheritance | Definition, Description with example | They will know about the process and example |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Linkage | Definition, Description with example with proper diagram. | They will know about the process and example, and how linkage in occur. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Crossing over | Definition, Description with example with proper diagram. | They will know about the process and example, and how crossing over in occur. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Molecular mechanism of crossing over | Description with proper diagram. | They will know about the process and the molecular reason behind the recombination process. . |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Holliday model | Description with proper diagram. | They will know about the process and the molecular reason behind the recombination process with Holliday model . |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Measuring recombination frequency | Mathematical process to measure recombination frequency | Students can able measure recombination frequency with some raw data. |

Signature of teacher

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Measuring linkage frequency | Mathematical process to measure linkage frequency | Students can able measure linkage frequency with some raw data. |

Signature of teacher

**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Three factor cross | The detailed process with proper diagram. | Students can infer the three point test cross and can measure linkage and recombination frequency. |

Signature of teacher

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Inference and coincidence | Mathematical process to measure Inference and coincidence | Students can able measure Inference and coincidence with some raw data. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Mutation basics | The introduction of mutation, its process with some example | Will know about the mutation and its causes |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Types of mutation | Different types of mutation with example | Students will know about different types of mutations and also some examples of it. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Types of chromosomal structural aberrations | Definition, description, types with proper diagram. | They will know about the process. Example and types of aberrations. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Types of chromosomal numerical aberrations | Definition, description, types with proper examples. | They will know about the process. example and types of aberrations. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Non disjunction | The detailed process with proper diagram | Students will know about the process and also some examples of it |

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Variations in chromosome numbers | The detailed process with proper diagram and examples. | Students will know about the process and also some examples of it |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Molecular basis of mutations in related to UV light | The molecular mechanism of mutations by UV light. | Students can able to distinguish the UV light induced mutations. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Molecular basis of mutations in related to chemical mutagens | The molecular mechanism of mutations by chemical mutagens | Students can able to distinguish the chemical mutagens induced mutations. |

Signature of teacher

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Significance of mutations | The significance and necessity of mutations | Students will know about the mutations and its evolutionary significance. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Basics of sex determination | The basic process of sex determination | Students will know how sex in determined in organisms. |

Signature of teacher

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Mechanism of sex determination in *Drosophila* | The basic process of sex determination in *Drosophila* with proper examples. | Students will know how sex in determined in *Drosophila* |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Sex determination in mammals | The basic process of sex determination in mammalswith proper examples. | Students will know how sex in determined in mammals |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Exercise related to sex determination | Different exercises with raw data. | Students become able to determine sex by raw data or experimental data. |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Dosage compensation in *Drosophila* | The meaning of dosage compensation and the process in *Drosophila* | Students will know about the process. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Dosage compensation in mammals | The meaning of dosage compensation and the process in mammals | Students will know about the process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Significance of Dosage compensation | The significance | Students will know the evolutionary significance of it. |

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Criteria for extra chromosomal inheritance | The meaning and process of extra chromosomal inheritance | Students will know the process and mechanism |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Antibiotic resistance in Chlamyadomonas | The significance of the process | Students will know the significance of Antibiotic resistance in Chlamyadomonas |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Kappa particle in Paramoecium | The meaning of it, the process of inheritance through it. | Will know about the process and significance . |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics** |  |  |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Shell spiralling in snail | The meaning of it, the process of inheritance through it. | Will know about the process and significance . |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Conjugation | The meaning of it, the process of inheritance through it with proper diagram. | Students Will know about the process and significance . |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Transformation | The meaning of it, the process of inheritance through it with proper diagram. | Students Will know about the process and significance . |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Transduction | The meaning of it, the process of inheritance through it with proper diagram. | Students Will know about the process and significance . |

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**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Significance of recombination in bacteria | The significance in detail | Students will know about the process and significance in very detail. |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Complementation test in Bacteriophage 1 | The meaning of it, the process of it with proper diagram. | Students will know about the process and significance . |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **Core T7 – Genetics**  Complementation test in Bacteriophage 2 | The meaning of it, the process of it with proper diagram. | Students will know about the process and significance . |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Classification and Biology of Honey Bees | The classification and basics of apiculture | Students will know about the apiculture practices. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Social Organization of Bee Colony | Bee colony and social group | Will know about the social groups and social behaviour of bees. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Artificial Bee rearing (Apiary), | The apiary structure and function | Students will know about the apiary structure and function in apiculture practices. |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Beehives – Newton and Langstroth | The framework of the bee hive. | Students will now about the structural architecture of a bee hive. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee pasturage | The meaning and function of it. | Students will know about the bee pasturage procedure |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Selection of Bee species | Different bee species for apiculture | Students will know different bee species used for apiculture in India |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee keeping equipment | The names and structure and use of it. | Students will able to identify and know about the different types of Bee keeping equipment |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Methods of extraction of honey by indigenously | The process of honey extraction and equipments use. | Students will know about the honey extraction procedure. |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Methods of extraction of honey by modern technique | The process of honey extraction and equipments use. | Students will know about the honey extraction procedure. |

Signature of teacher

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee disease | Name, types and example | Will know about the different types of bee diseases |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee enemies | Name of different enemies, types and example | Will know about the different types of bee enemies and predators. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Control measures | Different control measures to prevent from diseases. | Students will know about the control measures used for disease prevention in bees. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Preventive measures | Different control measures to prevent from diseases. | Students will know about the control measures used for disease prevention in bees. |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**    Products of Apiculture Industry and its Uses Honey, Bees Wax | Different commercial products extracted from bee colony and its commercial and domestic uses. | Students will learned about the bee industry and products extracted from bee colony. |

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Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Products of Apiculture Industry and its Uses propolis and pollen | Different commercial products extracted from bee colony and its commercial and domestic uses. | Students will learned about the bee industry and products extracted from bee colony. |

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**    Bee Keeping Industry – Recent Efforts-1 | Recent efforts to maximize the extracted products from bee colonies | Students know about the industry for betterment in future management. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee Keeping Industry – Recent Efforts-2 | Recent efforts to maximize the extracted products from bee colonies | Students know about the industry for betterment in future management. |

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Bee Keeping Industry – Recent Efforts-3 | Recent efforts to maximize the extracted products from bee colonies | Students know about the industry for betterment in future management. |

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**    Modern Methods in employing artificial Beehives for crosspollination in horticultural gardens-1 | To provide knowledge regarding entrepreneurship in apiculture by enabling them to understand the modern methods in employing artificial beehives for cross pollination in horticultural gardens. | To apply the knowledge of Apiculture entrepreneurship and utilize it to employ artificial bee hives. |

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Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Modern Methods in employing artificial Beehives for crosspollination in horticultural gardens-2 | To provide knowledge regarding entrepreneurship in apiculture by enabling them to understand the modern methods in employing artificial beehives for cross pollination in horticultural gardens. | To apply the knowledge of Apiculture entrepreneurship and utilize it to employ artificial bee hives. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **3rd Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T1 –Apiculture**  Modern Methods in employing artificial Beehives for crosspollination in horticultural gardens-3 | To provide knowledge regarding entrepreneurship in apiculture by enabling them to understand the modern methods in employing artificial beehives for cross pollination in horticultural gardens. | To apply the knowledge of Apiculture entrepreneurship and utilize it to employ artificial bee hives. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Sericulture: Definition,Types of silkworms, Distribution and Races | To understand the basics of Sericulture: Definition,types of silkworms, | To name the different types of silk-moth and to have a preliminary knowledge regarding sericulture. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Exotic and indigenous racesMulberry and non-mulberry Sericulture | Distribution and Races, the Exotic and indigenous races, the Mulberry and non-mulberry Sericulture | They gain knowledge about the Exotic and indigenous races, the Mulberry and non-mulberry Sericulture |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**  Basic structure of *Bombyx mori* | The general body morphology | Students will know about the basic bauplan of *Bombyx mori* |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Life cycle of Bombyx mori | To provide the knowledge on the Life cycle of *Bombyx mori*,. | Students gain knowledge about the life cycle of *Bombyx mori*,. |

Signature of teacher

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Structure of silk gland | Structure of silk gland and secretion of silk | Students will know about structure of silk gland and nature of silk. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    secretion of silk | The process of silk secretion from silk gland | Students will know about the process of silk secretion and chemistry of the silk. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Selection of mulberry variety | To provide conceptual knowledge regarding the Selection of mulberry variety | The students will gain knowledge about the selection of mulberry variety for rearing *Bombyx* species. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Establishment of mulberry garden | The process and technique used to establish mulberry garden | They will know about the scientific process of mulberry garden establishment. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Rearing house | The structure framework of rearing house | Students will gain knowledge about the architectural plan to construct a rearing house. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**  Rearing appliances. | The types of Rearing appliances used for rearing | Students know about the Rearing appliances used for rearing silk worm. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Disinfectants: Formalin, bleaching powder, RKO | Detailed types names and functioning of Disinfectants used. | Students will know about the Disinfectants used in rearing houses . |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Silkworm rearing technology: Early age and Late age rearing | The rearing technique in detail. | Students will know about the Early age and Late age rearing technology. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Types of mountages | Detail description with diagram | Will know about the different types of mountages used. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Spinning, harvesting and storage of cocoons | The detail step by step procedure of extraction of silk. | Students will know about the extraction of silk from silk worm. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Pests of silkworm: Uzi fly, dermestid beetles and vertebrates | Different pest that can harm silkworm | Students will know about the pest and can take management procedure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Pathogenesisof silkworm diseases: Protozoan, viral | Different types of diseases of the silkworm with proper symptoms. | Students will know about the diseases and can take management procedure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Pathogenesisof silkworm diseases: fungal and bacterial | Different types of diseases of the silkworm with proper symptoms. | Students will know about the diseases and can take management procedure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Control andprevention of pests | Different types control measure to prevent from pests of the silkworm. | Students will know about the Control andprevention measures and can take management procedure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**  Control andprevention of disease | Different types control measure to prevent from disease of the silkworm. | Students will know about the Control andprevention measures and can take management procedure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **4th Semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **SEC T4 –Sericulture**    Prospectus of Sericulture in India: Sericulture industry in different states, employment, potential  mulberry and non-mulberry sericulture. | To provide knowledge regarding the Entrepreneurship in Sericulture by enabling them to explore the Prospects of Sericulture in India, the Sericulture industry in different states, employment, potential in mulberry and non-mulberry sericulture. | To apply the knowledge of sericulture entrepreneurship and utilize it to employ artificial mulberry and non-mulberry sericulture. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Fleas as important insect vectors; | The basic morphology and biology of fleas | Students will about the role of fleas as a insect vector |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Host-specificity, Study of Flea-borne diseases – Plague | The cause, symptoms and preventive measure of disease. | Students will know details about the disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Host-specificity, Study of Flea-borne diseases – Typhus fever | The cause, symptoms and preventive measure of disease. | Students will know details about the disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Control of fleas | The preventive measure of flea attack. | Student will know how to minimize the flea bourne disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Human louse -Head, Body as important insect vector | The basic morphology, identifying feature , disease caused and preventive measure of it. | Students will know basic biology and pathogenicity of the louse. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Human louse –Body llouse as important insect vectors | The basic morphology, identifying feature , disease caused and preventive measure of it. | Students will know basic biology and pathogenicity of the louse. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Human louse - Pubic louse as important insect vectors | The basic morphology, identifying feature , disease caused and preventive measure of it. | Students will know basic biology and pathogenicity of the louse. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Control of human louse | The preventive measure of louse bourne diseases. | Student will know how to minimize the louse bourne disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Bugs as insect vectors | The basic morphology and biology of bug | Students will about the role of bugs as a insect vector |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Blood-sucking bugs | The basic morphology and biology of blood sucking –bug and its identifying features. | Students will about the role of blood-sucking bugs as a insect vector |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Chagas disease, | The cause, symptoms and preventive measure of disease. | Students will know details about the disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Bed bugs as mechanical vectors | The basic morphology and biology of bed –bug and its identifying features. | Students will about the role of bed- bugs as a insect vector |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **1st semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T2 -Insect Vectors and Diseases**  Control and prevention measures | The preventive measure of bug bourne diseases. | Student will know how to minimize the bug bourne disease. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Source of waste | Different sources and its identify its nature. | Students can identify the potential sources and take awareness against its exposure. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Waste types and characteristics | Different types of waste products and its chemical nature and also its harmful effects in environment. | Students will know its potential impact on environment. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Sewage disposal and its management | The nature, chemical properties, effect and control measure to prevent it from exposure | Students will know the details about its harmful effect and take precautionary measure and awareness. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Solid wastedisposal | The nature, chemical properties, effect and control measure to prevent it from exposure | Students will know the details about its harmful effect and take precautionary measure and awareness. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Biomedical waste handling and disposal | The nature, chemical properties, effect and control measure to prevent it from exposure | Students will know the details about its harmful effect and take precautionary measure and awareness. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Nuclear waste handling and disposal | The nature, chemical properties, effect and control measure to prevent it from exposure | Students will know the details about its harmful effect and take precautionary measure and awareness. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **2nd semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **GE T3 -Environment and Public Health**  Waste fromthermal power plant | The nature, chemical properties, effect and control measure to prevent it from exposure | Students will know the details about its harmful effect and take precautionary measure and awareness. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  General idea of Endocrine systems, | The basic idea of endocrinology | Students will know about the basic idea about endocrinology. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Classification, Characteristic of hormone | The different types of hormones with example | Will now about the types with its characters |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Transport of Hormones, | The transport mechanism and molecule involved in the process | Students will know about the mechanism in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Neurosecretions and Neurohormones | Definitions and types of hormones released | The biology and endocrinology of the hormones |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure of pineal gland, | The basic structure with diagram | Will know about the gland in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Secretions and their functions in biological rhythms | The secretion help during and its control | Will know about the glands functionality |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Pineal secretion in reproduction. | The secretion help during and its control | Will know about the glands functionality |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure and functions of hypothalamus and Hypothalamic nuclei, | The basic structure with diagram | Will know about the gland in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Regulation of neuroendocrineglands | The regulatory path with detail | Students will know the regulatory mechanism |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  , Feedback mechanisms | The process and different types. | Will know about the mechanism for regulation . |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure of pituitary gland, | The basic structure with diagram | Will know about the gland in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Hormones and their functions, | The role of different hormones released | Will know about the functional significance |

Signature of teacher

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**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Hypothalamo-hypophysial portal system, | The system in detail with diagram | The students will know about the system in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Disorders of pituitary gland. | The disorder occured after malfunctioning | Students will know about the pituitary malfunction |

Signature of teacher

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**Name of the Teacher: Puja Ghosh**

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Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation of Thyroid gland, | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation of parathyroid gland | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation Adrenal gland | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation Pancreas | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation of ovary | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Structure, Hormones, Functions and Regulation of testis | The hormone released and its functional significance | Students will know about the gland and its function |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Homeostasis over view | The overview of endocrine homeostasis | Will learn about the concept of homeostasis |

Signature of teacher

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Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Hormones in Calcium homeostasis | The role of hormone in glucose metabolism and regulation | Students will know about the process |

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Hormones in glucose homeostasis | The role of hormone in glucose metabolism and regulation | Students will know about the process |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Disorders of endocrine glands | Different disorders occurred after malfunctioning of different gland | Students can able to know about different endocrine disorders. |

Signature of teacher

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Mechanism of action of steroidal hormones with receptors | The mechanism with diagram and step by step process. | Students will know about the process and signalling machanism |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Mechanism of action of non-steroidal hormones with receptors | The mechanism with diagram and step by step process. | Students will know about the process and signalling machanism |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Bioassays of hormones using RIA & ELISA | The principles and techniques | Students will know about the basic technique |

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Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Estrous cycle in rat | The detail process and hormone involved | Will know about the process in detail |

Signature of teacher

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Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Menstrual cycle in human | The detail process and hormone involved | Will know about the process in detail |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Multifaceted role of Vasopressin | Its pleotropic role in human physiology | The multiple role of the hormone in physiological system |

Signature of teacher

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Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Multifaceted role of Oxytocin. | Its pleotropic role in human physiology | The multiple role of the hormone in physiological system |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Puja Ghosh**

Designation:Assistant Professor.

Semester/Year: **5th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| **DSE T1-Endocrinology**  Hormonal regulation of parturition | The role of hormones in parturition | Students will know about the process and hormone action |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th semester**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| DSE4  Introduction to biotechnology | Introduction and scopes | Students will know about the topic. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| DSE 4- organisation of prokaryotic and eukaryotic genome | Details about the genome organisation | Students will know about the genome in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| DSE 4 principal steps of biotechnology process | Discuss about the basic steps of the biotechnology process. | Students will know about the biotechnology process in detail. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| DSE4 restriction enzymes: types, nomenclature, properties and function. | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  DSE4 - cloning vectors: plasmid | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  DSE4 cloning vectors: cosmid, phagemid. | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  DSE 4 transformation and selection | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

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Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  DSE4 - genomic library | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  DSE 4- PCR, Electroporation  P-18 | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

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**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| Sem6  DSE 4- southern blotting | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

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Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| DSE4 - northern blotting  Western blotting | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| Sem6  DSE4- DNA sequencing: Sanger's method  DNA fingerprinting | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| Sem6  DSE4 production of transgenic animals: retroviral vectors, DNA microinjections | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| Sem6  DSE4 production of cloned animals by nuclear transplantation. Production of pharmaceuticals. | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| Sem6  DSE4 knockout mice  Production of donor organs | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  Animal cell culture | Discussion about the tools and techniques used for biotechnology. | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher

**North Bengal St. Xavier’s College**

**Name of the Teacher: Ananya das**

Designation:Assistant Professor.

Semester/Year: **6th sem**

Lesson Type: Theory

Duration: **1hrs**

Method of Teaching:

|  |  |  |
| --- | --- | --- |
| **Topic** | **Objective** | **Expected Course Outcome** |
| SEM 6  Practical class | Discussion about the tools and techniques used for practical biotechnology purposes | Students will know about the material and methodology of the different biotechnology experimental process. |

Signature of teacher