



<b>Subject</b>	<b>Microbiology</b>
<b>Paper No. and Title</b>	<b>DSE – 1 – B: Paper MIC - XIII: Microbial Genetics Bioinformatics</b>
<b>Module (Flipped classroom) Title</b>	<ul style="list-style-type: none"><li>• <b>Introduction to Bioinformatics</b></li><li>• <b>Types of Databases</b></li></ul>
<b>Module Tag</b>	<b>DAYA_MIC_XIII_V_M1</b>

**BY**

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**2020-21**

## Module No. 1

### Title – Module No.1, Bioinformatics (Introduction to Bioinformatics and types of databases)

**Prerequisites** – Students have understood and gained the basic biomolecular information and they have referred the various reference books on Molecular biology and genetics.

### Objectives of the Module

#### Sub Unit 1 -

	<b>Content</b>	<b>Objectives (Learner should be able to)</b>	<b>Cognitive Level</b>
1.1	Introduction to Bioinformatics (Definition and Concept)	Define Bioinformatics	Remembering
		Memorise the definition of Bioinformatics	Remembering
		Explain the concept of bioinformatics	Understanding
		Describe the various contents of bioinformatics	Understanding
		Compare the inter relationship with other stream of science	Analyzing
		Evaluate the novel advantages of bioinformatics	Evaluating
1.2	Introduction to major bioinformatics resources on Internet	Introduce and state the various major bioinformatics resources on internet	Understanding
		Explain the role of various major bioinformatics resources on internet	Understanding
		Write the various major bioinformatics resources on internet with examples	Applying
		Compare among the various major bioinformatics resources on internet	Analyzing

## Sub Unit 2 -

	<b>Content</b>	<b>Objectives (Learner should be able to)</b>	<b>Cognitive Level</b>
2.1	Types of Bioinformatics Databases	Describe the various types of Bioinformatics	Understanding
		Classify various types of Bioinformatics	Understanding
		Illustrate the various types of Bioinformatics	Analyzing
		Distinguish between the types of Bioinformatics	
		Write the role of various databases	Creating
2.2	Protein data bank (PDB) and Nucleic acid sequence database (GenBank) BLAST	Define Protein Data Bank and Nucleic Acid Sequence database	Remembering
		Describe the Protein Data Bank	Understanding
		Describe the Nucleic Acid Sequence database	Understanding
		Explain BLAST	Understanding
		Compare the PDB and GenBank	Analyzing
		Write the function of BLAST	Creating

## **Detailed Plan of Out-of -class and In-class activities**

### **Week 1**

Sub Unit 1 - Introduction to Bioinformatics (Definition and Concept) and Introduction to major bioinformatics resources on Internet

#### **Objectives –**

- To know the concept and Content of Bioinformatics
- To know the interrelationship between the Bioinformatics and other streams of science
- To know the various functions of Bioinformatics
- To know the various major bioinformatics resources available on internet.

#### **Resources Needed –**

##### **Title and Nature of Resources –**

**Syllabus of B.Sc.III Microbiology**

##### **Link-**

**<https://classroom.google.com/c/NDE0OTA4MDExNjRa/m/MzM4ODE0NTcxNjcx/details>**

**Material OER/URL/Instructor-made/Copy written/Text Book etc.**

##### **1) Reference Book: -**

**<https://classroom.google.com/c/NDE0OTA4MDExNjRa/m/MzM4ODE0NTcxNzUw/details>**

##### **2) PPT –**

**<https://classroom.google.com/c/NDE0OTA4MDExNjRa/m/MzM5NDAYMjQzMzI2/details>**

##### **3) Reference made -**

Video - **<https://youtu.be/lnRkKopf6GU>**

<b>Units</b>	<b>Out-of –class activity Details of Activity</b>	<b>In-class activity Details of Activity</b>	<b>Assessment</b>
1.1	<p>Students should read out the topic from the given reference books or posted resources</p> <p>Students should watch the posted videos</p>	<p>Discussion on the topic</p> <p>Check the level of understanding through Question – answer session</p>	<p>Question – answer session</p>
1.2	<p>Students should read out the topic from the given reference books or posted resources</p> <p>Students should refer the video's from</p>	<p>Discussion on the topic</p> <p>Check the level of understanding through Question – answer session</p>	<p>Question to write in detail</p> <p><a href="https://classroom.google.com/c/ND E0OTA4MDExNj Ra/sa/MzM5MTA 1NDg1OTcz/details">https://classroom.google.com/c/ND E0OTA4MDExNj Ra/sa/MzM5MTA 1NDg1OTcz/details</a></p>

## **Detailed Plan of Out-of -class and In-class activities**

### **Week 2**

Sub Unit 2 - Types of Bioinformatics Databases and Protein data bank (PDB) and Nucleic acid sequence database (GenBank), BLAST

Objectives –

- To know the various types of bioinformatics databases
- To understand the actual role of various databases in bioinformatics
- To know the distinguishing characteristics among the PDB and GenBank
- To know the functions of BLAST in sequence similarity searching.

**Resources Needed –**

**Title and Nature of Resources –**

**Syllabus of B.Sc. III Microbiology**

**Link-**

<https://classroom.google.com/c/NDE0OTA4MDExNjRa/m/MzM4ODE0NTcxNjcx/details>

**Material OER/URL/Instructor-made/Copy written/Text Book etc.**

**1) Reference Book: -**

<https://classroom.google.com/c/NDE0OTA4MDExNjRa/m/MzM4ODE1NTczMDAy/details>

**2)PPT: -** <https://www.slideshare.net/kamblesai2611/bioinformatics-86410334>

**3) Reference made -**

Video –

<https://youtu.be/GwHnoqwwi0I>,

[https://youtu.be/g5a\\_\\_okj5Zs](https://youtu.be/g5a__okj5Zs)

<https://youtu.be/HXEpBnUbAMo>

<b>Units</b>	<b>Out-of –class activity Details of Activity</b>	<b>In-class activity Details of Activity</b>	<b>Assessment</b>
2.1	<p>Students should read out the topic from the given reference books or posted resources</p> <p>Students should watch the posted videos</p>	<p>Discussion on the topic</p> <p>Check the level of understanding through Question – answer session</p>	Question – answer session
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