**Course 1:- Next Generation Sequencing (NGS)**

**(NGS Fundamentals & Applications)**

**Duration : 4 weeks**

**Content:-**

**Week1:-**

* **Comparing between Sangar & NGS**
* **What is NGS**
* **Intro in bash**

**Week2:-**

**-**

**الأسبوع 2:**

**Introduction to Bioinformatics**

**Week3**

**الأسبوع 3:**

**-** Bowtie/BWA

- FASTQ و BAM و VCF

- Sequencing technology

Week4:

- Library prep and QC

- Sequence Alignment

Week5:-

- Denovo Trans. Assembly

Week6:

Project

**(Intro to Drug Discovery using Bioinformatics & Biotech)**

**Duration : 5 weeks**

**Content:-**

**Week1:**

**-what is Drug discovery**

**- from target ID to clinical trials**

**Week2:**

Docking Simulation(AutoDock,pyRx)

Ligands

**Week 3 :-**

* ADMET prediction
* Use SwissADME وToxtree

**Week4:-**

**Case study : Discover drug for a disease**

* Understanding Drug repositing

Week 5

Project

**Course 3:(Metagenomics & Microbiome Analysis with R)**

**Duration : 6 weeks**

**Contant:-**

**Week1**

* **What is metagenomics?**
* **-Difference between Shotgun and amplicon**
* **Intro in 16S rRNA**

**Week2**

**-intro in 16SrRNA**

**Piplines**

**Week3**

**-Alpha Diversity (Chao1,Shannon ,simpsoin)**

**-Using R for it**

**Week4 :-**

Beta Diversity & Ordination Techniques (PCA, NMDS)

Classification

Week 5

* Application of Microbiome in Disease (IBD، Diabetes)
* A current project

**Week6**

**Project**