Course Schedule: November 2023 - April 2024

Department : Bioinformatics

Name/s of the Faculty : Ms. R. Sagaya Jansi

Course Title : Advances in Bioinformatics

Course Code : 19BI/PC/AB44

Week & No. of	Units & Topics	Teaching	Text & References	Method of
hours		Methodology		Evaluation
Nov 22 – 23,	Unit- 1	Lecture and	BOOKS FOR	Assignment
2023 (Day Order	1.1 Introduction to Next-	presentations	STUDY	presentations
1 & 2)	generation sequencing.		Head, Steven R.,	III
	History and Future of DNA		Ordoukhanian,	component
	Sequencing		Phillip, Salomon,	
			Daniel R, Next	
			Generation	
			Sequencing	
			Methods and	
			Protocols, Springer,	
			2018	
			Eija Korpelainen,	
			Jarno Tuimala, Panu	
			Somervuo, Mikael	
			Huss, Garry Wong,	
			RNA-seq Data	
			Analysis : A Practical	
			Approach, Taylor and	
			Francis	
			publishers2017	
Nov 24-30, 2023	1.2 Introduction to Linux	Lecture and	BOOKS FOR	Assignment
(Day Order 1 to	commands and Different	presentations	REFERENCE	presentations
6)	Platforms and Applications		Takashi Yamamoto.	III
			Targeted Genome	component
			Editing Using Site-	
			Specific Nucleases:	
			ZFNs, TALENs, and	
			the CRISPR/Cas9	
			System, 2015	
Dec 1-7, 2023	1.3 Different file formats –	Lecture and	BOOKS FOR	Assignment
(Day Order 1 to	FASTQ, SAM, BAM, GFF,	presentations	REFERENCE	presentations
6)	Databases and tools –		Jennifer Doudna,	III

	UCSCgenome, Galaxy,		Prashant Mali,	component
	SRA, NCBI refseq, ENA,		CRISPR-Cas: A	
	FastQC, Bowtie		Laboratory Manual,	
	TustQC, Downe		2016. Richard	
			Cummings, J. Pierce,	
			Handbook of	
			glycomics, Academic	
D 0 0 2022	T 0	T , 1	Press, 2009	
Dec 8-9, 2023	Unit 2	Lecture and	- do -	Assignment
(Day Order 1, 3)	2.1 Metagenomics –	presentations		presentations
	Introduction and biological			III
	background, case studies of			component
	recent research			
Dec 11-15, 2023	2.2 Alpha and Beta	Lecture and	-do-	Discussion
(Day Order 2 to 6	diversity of metagenomic	presentations		
)	studies			
Dec 16 – 22, 2023	2.3 Analysis of	Lecture and	- do -	Discussion
(Day Order 1 to	metagenome data and	presentations		
6)	logical steps for			
	metagenome analysis			
Jan 3 – 6, 2024	Unit 3	Lecture and	- do -	Discussion
(Day Order 1 to	3.1 Introduction and	presentations		
4)	Biological background,			
	case studies of recent			
	research			
Jan 8 – 12, 2024		C A Toget	. т	
		C.A. Test	; – 1	
Jan 13, 2024	3.1 Introduction and	Lecture and	- do -	Discussion
(Day Order 1)	Biological background,	presentations		
	case studies of recent			
	research			
Jan 18 -20, 2024	3.2 Quantifying RNA:	Lecture and	- do -	Assignment
(Day Order 4 to	RNA seq and other	presentations		presentations
6)	techniques. Generating	<u> </u>		test
,	expression table			
Jan 22-29, 2024	3.2 Quantifying RNA:	Lecture and	- do -	Assignment
(Day Order 1 to	RNA seq and other	presentations		presentations
6)	techniques. Generating	1		test
,	expression table			
Jan 30 – Feb 2,	3.3 Logical steps for	Lecture and	- do -	Assignment
2024	analysing RNA seq data –	presentations		presentations
(Day Order 1 to	differential expression and	r		I
4)	factor			
.,	140101		<u>l</u>	

	regression analysis			
Feb 3, 2024 (Day Order 2)	3.3 Logical steps for analysing RNA seq data – differential expression and factor regression analysis	Lecture and presentations	- do-	Assignment presentations
Feb 5- 6, 2024 (Day Order 5 to 6)	Unit 4 4.1 Gene regulatory dynamics from analysis of regulatory sequence motifs	Lecture and presentations	- do -	Assignment presentations III component
Feb 7 – 14, 2024 (Day Order 1 to 6)	4.1 Transcription factor- DNA interaction,	Lecture and presentations	- do -	Assignment presentations III component
Feb 15 – 22, 2024 (Day Order 1 to 6)	4.2 Local chromatin dynamics and epigenetic modifications,	Lecture and presentations	- do -	Test and puzzles
Feb 23 – 24, 2024 (Day Order 1 & 5)	4.2 RNA dynamics at the level of transcription and post-transcriptional processing,	Lecture and presentations	- do -	Test and puzzles
Feb 26 – Mar 1, 2024 (Day Order 2 to 6)	4.3 3D dynamics of chromatin and the resulting gene regulatory dynamics on daily and development time scales	Lecture and presentations	– do –	Test and puzzles
Mar 2, 2024 (Day Order 1)	Unit 5 5.1 Introduction to Crispr, cas9, selection of targets from sequences	Lecture and presentations	- do -	Test and puzzles
Mar 4 –8, 2024	-	C.A. Test –]	П	
Mar 9 – 16, 2024 (Day 6 & Day Order 1 to 6)	5.2 Targeted mutagenesis- recognition sequences, guide RNA design, recognition sequences	Lecture and presentations	- do -	Discussion
Mar 18 - 19, 2024 (Day Order 2 to 3)	5.3 Repair and data analysis of the edited genome, Therapeutic applications	Lecture and presentations	- do -	Discussion
Mar 20-22, 2024 (Day Order 4 to 6)		REVISION	I	

Course Schedule: November 2023 - April 2024

Department : Bioinformatics

Name/s of the Faculty : Dr. M. Sharanya

Course Title : Big Data Analysis

Course Code : 19BI/PC/BD44

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23,	UNIT – 1	Lecture and	BOOKS FOR	Assignment
2023	1.1 Introduction to data science	presentations	STUDY	presentations
(Day Order 1 &	1.1 Introduction to data science		Seema Acharya, Subhasini	III
2)			Chellappan, Big Data Analytics, Wiley 2015.	component
Nov 24-30, 2023	1.1 Case Studies: Data Science	Lecture and	BOOKS FOR	Assignment
,	in Biomedicine and Healthcare	presentations	REFERENCE	presentations
(Day Order 1 to		F	Peter Guerra and	III
6)	1.2 Sequence Processing,		Kirk Borne, Ten	component
	Medical Image Analysis		Signs of Data Science Maturity,	
			O'Reily media Pvt	
			ltd, 2016	
Dec 1-7, 2023	1.2 Natural Language	Lecture and	-do-	Assignment
(Day Order 1 to	Processing	presentations		presentations III
6)	1.3 Network Modelling and			component
	Probabilistic Modelling			-
Dec 8-9, 2023	Unit 2	Lecture and	- do -	Assignment
(Day Order 1, 3)	2.1 What is big data? What	presentations		presentations
	makes big data valuable			III
Dec 11 15 2022	2.1 Example of Dia Data	I actume and	-do-	Component Discussion
Dec 11-15, 2023	2.1 Example of Big Data2.2 Where Does Big Data	Lecture and presentations	-uo-	Discussion
(Day Order 2 to	Come From?	presentations		
6)				
Dec 16 – 22,	2.2. Machine-Generated Data	Lecture and	- do -	Discussion
2023	and Advantages	presentations		

(Day Order 1 to				
6)				
Jan 3 – 6, 2024	2.3 Big Data Generated by	Lecture and	- do -	Discussion
(Day Order 1 to	People organization of	presentations		
4)	Generated Data, integrating			
	the data			
Jan 8 – 12, 2024				
		C.A. Test – 1	I	
Jan 13, 2024	3.1 Characteristics of big data	Lecture and	- do -	Discussion
(Day Order 1)	Volume,	presentations		
Jan 18 -20, 2024	3.1. Variety, Velocity	Lecture and	- do -	Assignment
(Day Order 4 to		presentations		presentations
6)				test
Jan 22-29, 2024	3.2. Characteristics of Big	Lecture and	- do -	Assignment
(Day Order 1 to	Data – Veracity, Valence and	presentations		presentations
6)	Value			test
Jan 30 – Feb 2,	3.3 Getting value out of big	Lecture and	- do -	Assignment
2024	data using a 5-step process to	presentations		presentations
(Day Order 1 to	structure your analysis			
4)				
Feb 3, 2024	3.3 Getting value out of big	Lecture and	- do -	Assignment
(Day Order 2)	data using a 5-step process to structure your analysis	presentations		presentations
Feb 5- 6, 2024	4.1 Building a Big Data	Lecture and	- do -	Assignment
(Day Order 5 to	Strategy, How does big data	presentations		presentations III
6)	science happen?			component
Feb 7 – 14, 2024	4.1. Five Components of Data	Lecture and	- do -	Assignment
(Day Order 1 to	Science	presentations		presentations III
6)				component
Feb 15 – 22,	4.2 Steps in the Data Science -	Lecture and	- do -	Test and
2024	Acquiring Data	presentations		puzzles
(Day Order 1 to				
6)				
Feb 23 – 24,	4.2 preprocessing and	Lecture and	- do -	Test and
	Exploring Data	presentations		puzzles

2024				
(Day Order 1 &				
5)				
Feb 26 – Mar 1,	4.3 Analyzing Data, Communicating Results,	Lecture and presentations	- do -	Test and puzzles
2024 (Day Order 2 to	Turning Insights into Action	presentations		puzzies
6)				
Mar 2, 2024 (Day Order 1)	5.2 Introduction to Hadoop systems, The Hadoop Distributed File System	Lecture and presentations	– do –	Test and puzzles
Mar 4 –8, 2024		C.A. Test – II		
Mar 9 – 16, 2024 (Day 6 & Day	5.2. A Storage System for Big Data, YARN: A Resource	Lecture and presentations	- do -	Discussion
Order 1 to 6)	Manager for Hadoop			
	5.3 MapReduce: Simple Programming for Big Results, When to Reconsider Hadoop?			
Mar 18 - 19,	5.3 Cloud Computing: An	Lecture and	- do -	Discussion
2024	Important Big Data Enabler	presentations		
(Day Order 2 to				
3)				
Mar 20-22, 2024				-
(Day Order 4 to		REVISION		
6)				

Course Schedule: November 2023 - April 2024

Department : Bioinformatics

Name/s of the Faculty : Ms. R. Sagaya Jansi

Course Title : Advances in Bioinformatics - Practical

Course Code : 19BI/PC/P442

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23, 2023	Unit 1	Practical	BOOKS FOR	Practical
(Day Order 1 & 2)	1.1. Virtual machine		STUDY	Test
			Head, Steven R.,	
			Ordoukhanian, Phillip,	
			Salomon, Daniel R,	
			Next Generation	
			Sequencing	
			Methods and	
			Protocols, Springer	
			Protocols, Humana	
			Press, 2018.	
Nov 24-30, 2023	1.1. Introduction to	Practical	do	Practical
(Day Order 1 to 6)	UNIX commands			
Dec 1-7, 2023	Unit 2	Practical	do	Practical
(Day Order 1 to 6)	2.1. Analysis of			Test
	metagenomic raw data			
	using galaxy			
Dec 8-9, 2023	2.1. Analysis of	Practical	do	Practical
(Day Order 1, 3)	metagenomic raw data			Test
	using galaxy			
	(Continuation)			
Dec 11-15, 2023	-	-	-	-
(Day Order 2 to 6)				
Dec 16 – 22, 2023	Unit 3	Practical	do	Practical
(Day Order 1 to 6)	3.1. Cancer data analysis			Test
	using Webmev			
Jan 3 – 6, 2024	3.1. Cancer data analysis	Practical	do	Practical
(Day Order 1 to 4)	using Webmev			Test
	(Continuation)			
Jan 8 – 12, 2024		C.A. Tes	st – I	

Unit 4	Practical	do	Practical
	Tractical	40	Test
• •			Test
using biojupies - beds			
4.1 DNA sog analysis	Prostical	do	Practical
	Practical	00	Test
0 3 1			Test
•	Dunatical	do	Duo ati a al
	Practical	do	Practical
			Test
database			
-	-	-	-
-	-	-	-
• •	Practical	do	Practical
using Epimara			Test
4.1. RNA seq analysis	Practical	do	Practical
using Epimara- TF			Test
prediction			
4.1. RNA seq analysis	Practical	do	Practical
using Epimara- TF			Test
prediction			
-	-	-	-
Unit 5	Practical	do	Discussion
5.1 Small guide RNA			
	C.A. Tes	t – II	l
5.1 Small guide RNA	Practicals	do	Discussion
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	using Epimara- TF prediction 4.1. RNA seq analysis using Epimara- TF prediction -	4.1. RNA seq analysis using Biojupies - DEGs 4.1. RNA seq analysis using Biojupies - Volcano plot 4.1. RNA seq analysis using Biojupies - Lincs database 4.1. RNA seq analysis using Epimara 4.1. RNA seq analysis using Epimara 4.1. RNA seq analysis using Epimara- TF prediction 4.1. RNA seq analysis using Epimara- TF prediction	4.1. RNA seq analysis using Biojupies - DEGs 4.1. RNA seq analysis using Biojupies - Volcano plot 4.1. RNA seq analysis using Biojupies - Lincs database 4.1. RNA seq analysis using Epimara 4.1. RNA seq analysis using Epimara 4.1. RNA seq analysis using Epimara 4.1. RNA seq analysis using Epimara-TF prediction 4.1. RNA seq analysis using Epimara-TF prediction

Course Schedule: November 2023 - April 2024

Department : Bioinformatics

Name/s of the Faculty : Ms. Pujaa B

Course Title : Basics of Clinical Research Management

Course Code : 19BI/PE/CR15

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23, 2023 (Day Order 1 & 2)	Unit 1: 1.1 History of drug development. Pharmaco- epidemology.	Lectureand Power Point presentations	Text Books: Lori A. Nesbitt, (2004) "Clinical Research What It Is andHow It Works", Jones Barlett Publishers, UK Steven Piantadosi, (2005), "Clinical Trials A Methodologic Perspective", Second Edition, John Wiley & Sons, UK.	Discussion
Nov 24-30, 2023 (Day Order 1 to 6)	1.2. Issues in Clinical Trials. Nuremberg Code, Declaration of Helsinki. International Conference of Harmonization and Good Clinical Practice.	Lecture and case study	Books for Reference: Richard K. Rondel, Sheila A. Varley, Colin F. Webb,(2002) "Clinical Data Management", Second Edition, John Wiley& Sons, UK.	Assignment and exercise
Dec 1-7, 2023 (Day Order 1 to 6)	1.3 Clinical trials- History of Clinical trials-stages of Clinical trials	Lectureand Power Point presentations	-do-	Exercise & and test
Dec 8-9, 2023 (Day Order 1, 3)	Unit 2: 2.1 Introduction to Drug Discovery and Development, Approaches,	Lectureand Power Point presentations	-do-	Case Study

	Sources of Drugs, Databases for drug search			
Dec 11-15, 2023	2.2Pharmacokinetics and	Lectureand	-do-	III
(Day Order 2 to	pharmacodynamics,	Power Point		component
6)	Toxicological requirements	presentations		Seminar
Dec 16 – 22,	2.3 Emerging technologies	Lectureand	-do-	Assignment,
2023	in Drug Discovery.	Power Point		III
(Day Order 1 to		presentations		component
6)				Written test
Jan 3 – 6, 2024	2.3 Preclinical Testing,	Lectureand	-do-	Assignment,
(Day Order 1 to	Clinical Trials	Power Point		III
4)		presentations		component
				Written test
Jan 8 – 12, 2024		C.A. Test	: - I	
Jan 13, 2024	Unit 3:	Lectureand	-do-	III
(Day Order 1)	3.1 Evolution and History of	Power Point		component
	Regulations in Clinical	presentations		Seminar
	Research.			
Jan 18 -20, 2024	3.1 US FDA Regulations,	Lectureand	-do-	III
(Day Order 4 to	IND, NDA, ANDA, FDA	Power Point		component
6)	Audits and Inspections	presentations		Seminar
Jan 22-29, 2024	3.2 European Regulatory	Lectureand	-do-	Lectureand
(Day Order 1 to	Affairs, Organization and	Power Point		Power Point
6)	Functions	presentations		presentations
Jan 30 – Feb 2,	3.3 Indian Regulatory	Lectureand	-do-	III
2024	system, Schedule Y- Rules	PowerPoint		component
(Day Order 1 to	and Regulations.	presentations		Seminar
4)				
Feb 3, 2024	3.3 Post Drug	Lectureand	-do-	III
(Day Order 2)	Approval Activities, PMS	Power Point		component
		presentations		Seminar
Feb 5- 6, 2024	Unit 4:	Lecture and	-do-	Written test
(Day Order 5 to	4.1 Role of Ethics	case study		& Group
6)	Committees and	-		Discussion
	Institutional Review Boards.			
Feb 7 – 14, 2024	4.1 Special populations;	Lecture and	-do-	Written test
(Day Order 1 to	women elderly and children	case study		& Group
6)	-	_		Discussion
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Feb 15 – 22, 2024	4.2 Designing of Protocol,	Lecture and	-do-	Case Study,

(Day Order 1 to	SOP, ICF,	case study		III
6)	Pharmacovigilance			component
Feb 23 – 24, 2024	4.3 Project management	Lecture,	-do-	Exercise and
(Day Order 1 &	Documentation, Monitoring,	Guided		case study
5)	Audits, Inspections, Fraud	Protocol		presentation
	and Misconduct.	writing		
Feb 26 – Mar 1,	4.3 Roles and	Lecture,	-do-	Exercise and
2024	Responsibilities of Clinical	Guided		case study
(Day Order 2 to	Research Professionals	Protocol		presentation
6)		writing		
Mar 2, 2024	Unit 5:	Lectureand	-do-	Exercise and
(Day Order 1)	5.1 Importance of CDM in	Power Point		case study
	clinical research, Clinical	presentations		presentation
	Data Entry, CRF, e-CRF			
Mar 4 –8, 2024		C.A. Test	– II	_ I
Mar 9 – 16, 2024	5.2Statistical considerations	Discussionof	-do-	Discussion
(Day 6 & Day	at the design, analysis and	case study		
Order 1 to 6)	reporting stage.			
Mar 18 - 19, 2024	5.3 Data validation, SAE	Lectureand	-do-	Discussion
(Day Order 2 to	reconciliation, Quality	Power Point		
3)	Assurance	presentations		
Mar 20-22, 2024		<u> </u>		
(Day Order 4 to	REVISION			
6)				