

Module name		Genomics Data Analysis			
Module level, if applicable		Master's degree in 1 st year			
Code, if applicable		MST-534			
Semester(s) in which the module is taught		2 nd (second)			
Person responsible for the module					
Lecturer					
Language		Bahasa Indonesia			
Relation to curriculum		Compulsory course in the first year (1 st semester) Master Degree			
Types of teaching and learning	Class size	Attendance time (hours per week per semester)	Form of active participation	Workload (hours per semester)	
Interactive Lecturing	< 20	2.5	Problem solving	Face to face teaching	35
				Structured activities	48
				Independent study	48
				Exam	5
Total Workload		136 hours			
Credit points		3 CUs / 5.1 ECTS			
Requirements according to the examination regulations		Minimum attendance at lectures is 75%. Final score is evaluated based on quiz, assignment, mid-term exam, and final exam.			
Recommended prerequisites		-			
Related course		-			
Module objectives/intended learning outcomes		After completing this course, the students have ability to: CO 1. Compose a structured scientific report based on genomics data analysis CO 2. Analyze and develop a solution of NGS data through R programming CO 3. Understand the genomics data characteristics and basic of genomics analysis CO 4. Be up to date with genomics knowledge and technology			
Content		1. Genomics basic concept: DNA, Central Dogma in Biology, DNA Sequencing, FASTA dan FASTQ file, quality control of genomics data, genomics data bases 2. Linux and R introduction 3. Statistics for genomics 4. Basic processing genomics data: DNA Blast and mapping 5. Variant identification and inferential (Variant Calling) 6. Genome Wide Association (GWAS) 7. Multiomics Data Integration			
Study and examination requirements and forms of examination		The final mark will be weighted as follows:			
		No	Assessment components	Assessment types	Weight (percenta
		1	CO 1	Assignment, Midterm Exam	35%
		2	CO 2	Assignment, Final Exam	30%

	3 CO 3 Assignment, Quiz 20%
	4 CO 4 Assignment, Quiz 15%
Media employed	Google Classroom, relevant websites, slides (power points), video, interactive media, white-board, laptop, LCD projector
Reading list	1. Florian Hahne, Wolfgang Huber, Robert Gentleman, and Seth Falcon, Bioconductor Case Studies, Springer 2. Robert Gentleman, R Programming for Bioinformatics, CRC Press 3. Robert Gentleman, Vince Carey, Wolfgang Huber, Rafael Irizarry, Sandrine Dudoit, Bioinformatics and Computational Biology Solutions Using R and Bioconductor, Springer 4. Gareth James and Daniela Witten, An Introduction to Statistical Learning with Applications in R, Springer 5. Andy Field, Jeremy Miles, and Zoe Field, Discovering Statistics Using R, Sage Publication 6. Fajriyah, R. (2019). Lecture Notes on Bioinformatika I. Dept of Statistics, Universitas Islam Indonesia 7. R. Fajriyah, 2021, Paper review: an overview on microarray technologies, Bull. Appl. Math. Math. Educ., 1 (1) (2021), p. 21, 10.12928/bamme.v1i1.3854 8. Fajriyah, R. (2015). Generalized Beta Convolution Model of the True Intensity for the Illumina Bead Arrays. <i>Thailand Statistician</i>, 13(2), 145–167. Retrieved from https://ph02.tci-thaijo.org/index.php/thaistat/article/view/37769 9. MF Azhari, R Fajriyah, Identifikasi Gen Marker Pbmcs Ischemic Stroke Menggunakan Analisis Bioinformatika dan Support Vector Machine, Jurnal TIMES, 2024 10. Azhari, M. F., Rohmatul Fajriyah, Izzati Muhimmah, Dan Jeric Arcega Rustia, Smulders, M. J., & Gracianna Devi, M. (2024). Detection and Quantification of Glandular Trichomes (Bulbous) on Potato Plant Leaf Images Using Deep Learning. <i>Enthusiastic : International Journal of Applied Statistics and Data Science</i>, 4(2), 96–108. https://doi.org/10.20885/enthusiastic.vol4.iss2.art2 11. Fajriyah, R, and Riantika, I. 2024, Machine Learning d a l a m Analisis Penyakit K a n k e r P a r u - P a r u , SBRC Series Analisis Data Kesehatan 2.01, UII, Jogjakarta 12.- (2010). Modern Molecular Biology: Approach for Unbiased Discovery in Cancer Research, editor: Srinivasan Yegnasubramanian, William B. Isaacs, Springer, Heidelberg 13. Susan Holmes and Wolfgang Huber, (2018), Modern Statistics for Modern Biology, Cambridge University Press, UK

Date :	Date :	Date : Sept 5, 2024
Authorized by Head of Study Program:	Examined by Coordinator of Cluster Interest	Prepared by Lecturer/Coordinator of Lecturers:

Rohmatul Fajriyah	Rohmatul Fajriyah	Rohmatul Fajriyah