Module designation	Omics: From Genomes to Biomes
Semester(s) in which the module is taught	Even
Person responsible for the module	Tri Rini Nuringtyas, S.Si., M.Sc., Ph.D
Language	English-Indonesia
Relation to curriculum	*Elective course*
Teaching methods	*Lecture lesson, Presentation, Discussion, Reading reference books and studying lecture material from presentation slides that have been distributed by lecturers through simaster.ugm.ac.id and https://elok.ugm.ac.id/.*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *Contact hours (please specify whether lecture, exercise, laboratory session, etc.):* *Private study including examination preparation, specified in hours:*
Credit points	2 credits
Required and recommended prerequisites for joining the module	
Module objectives/intended learning outcomes	*Students competency for courses:* *Course Outcome* (CO) 1 : *Understanding the overview about metabolomics and other omics.* *Mengetahui cakupan dan apa itu studi metabolomics* *Mengetahui kedudukan metabolomics pada omics yang lain* *Course Outcome* (CO) 2 : *Understanding the use of metabolomics software and applications for molecular sciences.* *Mengetahui aplikasi aplikasi metabolomics* *Course Outcome* (CO) 3 : *Understanding the tools in metabolomics studies.* *Mengetahui tools yang diperlukan untuk studi metabolomics*

	Learning outcomes: *LO-10 Be able to utilize software for analyzing research data to give result and conclusion or to test the prediction hypothesis. (CO : 1,2,3)*
Content	*This course discusses about omics application for living resources, genomics, trancriptomics, proteomics and metabolomics related to the analytical techniques.* *Matakuliah ini membahas pengantar aplikasi omics untuk ilmu hayati, yang mencakup genomics, trancriptomics, proteomics dan metabolomics serta teknik analisa terkait* *Main topics of discussion:* *1. Introduction to Omics: From Genomes to Biomes* *2. Introduction to Metabolomics : Fun Genomes Platform* *3. Genetic Information and Gene Expression Analysis* *4. Explanation related to Protein and Proteomics* *5. Tools that can be used for the Omics Approach* *6. Introduction, basic principles of NMR devices and their applications* *7. Introduction, basic principles of HPLC tools and their applications* *8. Introduction, basic principles of UPLC tools and their applications* *9. Overview of Metabolomics* *10. Research design and work flows omics* *11. Multivariate data analysis (explanation of basic principles and influencing points)* *12. Multivariate data analysis (practice using application and discussion)* *1. Pengantar Omics: From Genomes to Biomes* *2. Pengantar Metabolomik : Fun Genomes Platform* *3. Genetic Information and Gene Expresion Analysis* *4. Penjelasan terkait Protein dan Proteomik* *5. Peralatan yang bisa digunakan untuk Pendekatan Omics* *6. Pengenalan, prinsip dasar alat NMR dan aplikasinya* *7. Pengenalan, prinsip dasar alat HPLC dan aplikasinya* *8. Pengenalan, prinsip dasar alat UPLC dan aplikasinya* *9. Overview of Metabolomics* *10. Research design dann work flows omics*

	11. Multivariate data analisis (penjelasan prinsip dasar dan poin-poin yang mempengaruhi)
	12. Multivariate data analisis (praktek menggunakan aplikasi dan diskusi).
Examination forms	*Essay, oral presentation, and paper*
Study and examination requirements	*To be able to take the post test, the minimum of student attendance is 100% out of effective laboratory session.* *Weighting score :* a. Quiz : 5% (CO : 2) b. Group Discussion : 10% (CO : 1) c. Individual task : 35% (CO : 1,3) d. Midterm exam : 25% (CO : 2) e. Final exam : 25% (CO : 2,3)
Reading list	*1. Database: NCBI, PubMED, RAST, etc.* *2. Journal Bioinformatics*