



KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS BRAWIJAYA
FAKULTAS KEDOKTERAN
PROGRAM MAGISTER ILMU BIOMEDIK

Jalan Veteran, Malang 65145, Jawa Timur – Indonesia
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 E-mail: sekr.fk@ub.ac.id Website: <http://biomedical.fk.ub.ac.id>

Teaching Plan

Course Title : Biosciences and Biotechnology
Course Code : DKF6209
Credits : 2
Course Coordinator : Agustina Tri Endharti, S.Si., Ph.D.
 (Phone: 085233140794, email: tinapermana@yahoo.com)

Course Description

The overall goal of this course is to introduce students to the important concepts and principles of research skills in biosciences and biotechnology. Topics previously covered in the basic research and applied science in biosciences and biotechnology. The basic research will be expanded and placed in the context of clinical application. The key objective is to understand and conduct research and analyze their research data independently. Subject areas covered include procedure of detection of apoptosis, cell Cycle analysis, RNA isolation, culture of monocytes, poly chain reaction (PCR) technique, DNA cloning, fundamentals of high-performance liquid chromatography (HPLC).

Course Learning Outcomes

On successful completion of this course students will (be):		Bloom's Taxonomy
CLO1	Demonstrate a comprehensive understanding of the principle and technique of apoptosis detection, cell cycle analysis, RNA Isolation, monocytes culture, PCR, DNA cloning, and HPLC.	Level 2. Understanding
CLO2	Demonstrate a comprehensive understanding of the clinical applications of DNA cloning methods.	Level 2. Understanding
CLO3	Able to analyze and interpret the flow cytometry data related to detection of apoptosis and cell cycle analysis, the results of RNA Isolation, monocytes culture, DNA cloning, and HPLC.	Level 3. Applying
CLO4	Able to analyze and interpret the clinical data related to the PCR results as supporting data to the diagnosis of disease.	Level 3. Applying
CLO5	Able to critically appraise the biosciences and biotechnology journal article relevant to student's interest and communicate it through oral presentation.	Level 5. Evaluating
CLO6	Demonstrate self-directed learning and ethical standards for the intellectual activities.	Level 3. Applying

Links between CLOs and PLOs

	PLO1.1	PLO1.2	PLO2.1	PLO2.2	PLO2.3	PLO3.1	PLO3.2	PLO3.3	PLO3.4	PLO4
CLO1		√								
CLO2		√								
CLO3			√	√	√		√			√
CLO4			√	√	√		√			√
CLO5		√	√			√	√			√
CLO6							√			√

Topics and Schedule

Week	Topics	Competencies	Lecturer
1	Procedure for detection of apoptosis and data analysis by Cell Quest software	Able to explain the principle and technique of apoptosis detection. Able to analyze and interpret the results of apoptosis detection.	Agustina Tri E., S.Si., Ph.D.
2	Procedure for cell cycle analysis and data analysis by Cell Quest software	Able to explain the principle and technique of cell cycle analysis. Able to analyze and interpret the results of cell cycle analysis.	Agustina Tri E., S.Si., Ph.D.
3	Procedure for RNA Isolation	Able to explain the principle and technique of RNA isolation. Able to analyze and interpret the RNA product.	Agustina Tri E., S.Si., Ph.D.



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4	Technique of monocytes culture	Able to explain the principle and technique of monocytes culture. Able to analyze and interpret the results of monocytes culture.	Dr. dr. Loeki E.F., M.Kes., Sp.ParK.
5	PCR	Able to explain the principle and technique of PCR Able to analyze and interpret the results of PCR.	Dr. dr. Loeki E.F., M.Kes., Sp.ParK.
6	DNA cloning	Able to explain: -Plasmids as Engineering Tools -DNA cloning in medical application -Procedure of DNA cloning	Dr.rer.nat. Tri Yudani M. Raras, M.App.Sc.
7	Procedure for HPLC	Able to explain the principle and technique of HPLC analysis. Able to analyze and interpret the results of HPLC analysis.	dr. Dian Nugrahenny, M.Biomed.
8	Journal Critical Appraisal and Oral Presentation	Able to critically appraise the biosciences and biotechnology journal article relevant to student's interest and communicate it through oral presentation	Team
9	Journal Critical Appraisal and Oral Presentation	Able to critically appraise the biosciences and biotechnology journal article relevant to student's interest and communicate it through oral presentation	Team
10	Final Exam		Team

Teaching and Learning Strategy

The materials will be delivered through lectures and laboratory works, and also assignments in the form of scientific paper, journal reading completed with an oral presentation.

Assessment Methods

Type	Weighting	CLO Assessed	Description
Scientific Paper	20%	1, 2, 6	Make a scientific papers related to the topic on theoretical aspects of biosciences and biotechnology.
Laboratory Report	30%	1, 2, 3, 4	Complete laboratory work report contains an introduction, the basic principle, the procedure, and the results, following with discussion.
Journal Critical Appraisal and Oral Presentation	20%	1, 2, 5, 6	The assessment will comprise a 1000 word executive summary (in English) of research paper or review from scientific journals. The assessment includes a 15 minutes presentation on the highlights of the journal followed by 10 minutes of discussion.
Written Exam (Final)	30%	1, 2, 3, 4, 6	The examination will be a 2-hour unseen paper with questions on theoretical aspects of bioscience and biotechnology.

Learning Sources

Essential reading/resources	<ol style="list-style-type: none"> 1. Practical Immunology, 4th Edition, by Frank C. Hay and Olwyn M.R. Westwood. Publisher: Blackwell Science 2. Cellular and Molecular Immunology. 2007. Abbas AK, Lichtman AH, Pillai S, 3. Immunobiology, 2008. Murphy K, Travers P, Walport M. Janeway's 7th ed., Publisher: Garland and Science, New York
Further reading/resources	Scientific Journals (Nature, Journal of Immunology, European Journal of Immunology, The Journal of Experimental Medicine)

Course Coordinator,

Agustina Tri Endharti, S.Si., Ph.D.