



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

Jalan Veteran, Malang 65145, Jawa Timur – Indonesia  
 Telp. (62)(341) 569117; 567192 Pes. 134, 135 – Fax. (62)(341) 564755  
 E-mail: [sekr.fk@ub.ac.id](mailto:sekr.fk@ub.ac.id) Website: <http://biomedical.fk.ub.ac.id>

## Teaching Plan

**Course Title** : Clinical Pharmacology  
**Course Code** : DKF6038  
**Credits** : 2  
**Course Coordinator** : dr. Nur Samsu, Sp.PD-KGH  
 (Phone: +628123316315, email: [samsu\\_nrs@yahoo.com](mailto:samsu_nrs@yahoo.com))

### Course Description

This course was designed with overall goal is to introduce students to the principles of drugs used in several diseases that are important in clinical practice. The key objective is to understand and apply the drugs as therapeutic agents, the use of drugs, also the beneficial and harmful effects of drugs in individual and society. Subject areas covered include an overview of clinical pharmacology, pharmacokinetics, and pharmacodynamics, drugs interaction, application of anti-epileptic drugs, drugs used in the cardiovascular and respiratory system, immunostimulants, immunosuppressants, drugs used in particular conditions, and drugs monitoring.

### Course Learning Outcomes

On successful completion of this course students will:		Bloom's Taxonomy
<b>CLO1</b>	Demonstrate a comprehensive understanding of the principles of pharmacokinetics and pharmacodynamics, principles of clinical trials, drugs monitoring, and drugs interaction.	Level 2. Understanding
<b>CLO2</b>	Demonstrate a comprehensive understanding of the basic concepts of volume of distribution (Vd), clearance (Cl), half-life of elimination (T <sub>1/2</sub> ), elimination rate constant (Ke), Area Under the Curve (AUC), peak concentration in plasma (C <sub>max</sub> ), time to reach C <sub>max</sub> (T <sub>max</sub> ), concentration at steady-state (C <sub>ss</sub> ), loading dose, maintenance dose, MIC/MBC, time-killing curves, concentration-dependent vs non-dependent killing.	Level 2. Understanding
<b>CLO3</b>	Able to apply the use of antibiotics, cardiovascular drugs, anti-epileptic drugs, and drugs used in the respiratory system.	Level 3. Applying
<b>CLO4</b>	Able to apply the use of drugs in pediatrics and elderly patients.	Level 3. Applying
<b>CLO5</b>	Able to apply the use of antibiotics, especially aminoglycoside, in patients with renal impairment.	Level 3. Applying
<b>CLO6</b>	Able to interpret the scientific paper relating to the understanding of the roles of cell function and cell system and communicate it through oral presentation.	Level 3. Applying
<b>CLO7</b>	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
<b>CLO1</b>	√									
<b>CLO2</b>	√									
<b>CLO3</b>		√	√							
<b>CLO4</b>		√	√							
<b>CLO5</b>			√			√	√			
<b>CLO6</b>	√	√	√			√	√			√
<b>CLO7</b>							√			√

### Topic and Schedule

Week	Topics	Competencies	Lecturer
1	Clinical Pharmacology Overview	Able to explain: all aspects of the relationship between drugs and humans	MA
2	Pharmacokinetics and Pharmacodynamics	Able to explain: volume of distribution (Vd), clearance (Cl), half-life of elimination (T <sub>1/2</sub> ), elimination rate constant (Ke), Area Under the Curve (AUC), peak concentration in plasma (C <sub>max</sub> ), time to reach C <sub>max</sub> (T <sub>max</sub> ), concentration at steady-state (C <sub>ss</sub> ).	SW



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3	Clinical Pharmacokinetics	Able to apply: drug dosage adjustment in impaired renal function.	NS
4	Immunostimulants	Able to explain: substances (drugs and nutrients) that stimulate the immune system by inducing activation or increasing the activity of any of the components.	WB
5	Drug Interactions	<u>Able to explain</u> : drug interactions in pharmacokinetics (inhibition of absorption, enzyme inhibition increasing the risk of toxicity, enzyme inhibitors resulting in reduced drug effect, enzyme induction resulting in reduced drug effect, enzyme induction resulting in toxic metabolites, altered renal elimination). <u>Able to explain</u> : drug interactions in pharmacodynamics (additive pharmacodynamics, antagonistic pharmacodynamics).	MAW
6	Application of Anti-Epileptic Drugs (AEDs)	Able to explain: commonly used AEDs and proposed mechanisms of action, including carbamazepine, phenytoin, valproic acid, phenobarbital, gabapentin.	MA
7	Principles of Clinical Trial	Able to explain: protecting trial participants; conduct of clinical trials; ensuring objectivity in clinical trials; and disclosure of clinical trial results.	SW
8	<b>Mid-Term Exam</b>		<b>TEAM</b>
9	Application of Aminoglycosides	Able to apply: the use of aminoglycoside in patients with renal impairment.	NS
10	Drug Monitoring – MESO	Able to explain: therapeutic drug monitoring.	WB
11	Application of Cardiovascular Drugs	Able to apply: the use of digoxin in patients with heart failure.	MAW
12	Application of Drugs used in Respiratory System	Able to apply: the use of bronchodilators in asthmatic patients.	SW
13	Immunosuppressant	Able to explain: mechanisms of action of cyclosporine, azathioprine, MMF, monoclonal antibodies, including basiliximab, daclizumab, and muromonab, and corticosteroids.	NS
14	Drugs in Particular Conditions	Understand about drug therapy in pediatric and geriatric patients,	WB
15	Journal reading and oral presentation	Able to interpret the scientific paper relating to the understanding of the roles of cell function and cell system, then able to communicate effectively and succinctly through oral presentation	TEAM
16	<b>Final-Exam</b>		<b>TEAM</b>

**Team of Lecturers:**

NS	: dr. Nur Samsu, Sp.PD-KGH	(08123316315)
MA	: Prof. Dr. dr. Mulyohadi Ali	(081218894201)
SW	: Dr. dr. Setyawati, M.Kes.	(0811363743)
MAW	: Prof. dr. M. Aris Widodo, MS., Sp.FK., Ph.D.	(081334263999)
WB	: Dr. dr. Wisnu Barlianto, M.Si.Med., Sp.A.(K)	(08123319895)

**Teaching and Learning Strategy**

Core material will be delivered through lectures and case studies, completed with oral presentations of scientific journal reading.



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**Assessment Methods**

Type	Weighting	CLO Assessed	Description
Journal Reading and Oral Presentation	20%	6, 7	Students are assigned a scientific paper to review and describe as an oral presentation. The assessment will comprise a 1000 word executive summary of research paper or review from scientific journals; this assessment includes a 15 minutes presentation on the highlights of the journal followed by 10 minutes of discussion.
Written exam (mid)	40%	1, 2, 3, 7	The examination will be a 2-hour unseen paper with questions on clinical practice in pharmacology.
Written exam (final)	40%	3, 4, 5, 7	

**Learning Sources**

<b>Essential reading/resources</b>	<ol style="list-style-type: none"><li>1. Basic and Clinical Pharmacology, 13th Edition, by Bertram G. Katzung and Anthony J Trevor. Publisher Mc Graw Hill.</li><li>2. Goodman and Gilman's The Pharmacological Basis of Therapeutics, 13th Edition, by Laurence L Brunton, John S Lazo, Keith L Parker. Publisher Mc Graw Hill.</li></ol>
<b>Further reading/resources</b>	Scientific journals relevant to clinical pharmacology.

**Course Coordinator,**

**dr. Nur Samsu, Sp.PD-KGH**