

Course Title	Molecular Pharmacology				
Course Code	BMS414				
Course Type	Compulsory				
Level	Bachelor (1st Cycle)				
Year / Semester	4 th Year / 7 th Semester				
Teacher's Name	TBA				
ECTS	5	Lectures / week	3 Hours	Laboratories / week	None
Course Purpose and Objectives	<p>The basic aim of the course is to teach students the molecular basis of drug action. Drugs act via receptors, ion channels, or other proteins that mediate cell signalling. Drugs may be receptor blockers or activators, enzyme inhibitors, or act via physicochemical properties. Receptors, and ion channels can be classified into families and these will be described and studied as potential drug targets.</p>				
Learning Outcomes	<p>The aim of the course is to get an understanding of the molecular basis of drug action, and the use of molecular pharmacology in personalized medicine and drug safety.</p> <p>At the end of the course students should be able to:</p> <ul style="list-style-type: none"> • recall the molecular mechanism of action for the most important drugs. • explain the different ways drugs may act • describe the nature of drug receptor interactions that result in therapeutic response • recall the nature of drugs and classify them according to their activity (agonists, antagonists, inverse agonists, partial agonists) • classify the different types of receptors that drugs act on with emphasis on G protein coupled receptors. • describe the role and function of ion channels, and how they can be modulated pharmacologically in various diseases. • define the molecular basis of cell excitability • explain the meaning of dose response curves and their usefulness in drug efficacy, potency and safety • recognize the role of molecular pharmacology in current medicine as related to personalized medicine (pharmacogenomics) 				
Prerequisites	BMS111, BMS213	Co-requisites	None		

Course Content	<p>Course content contains:</p> <ul style="list-style-type: none"> • Voltage or ligand gated ion channels will be studied with respect to activation/deactivation and their role in signalling and cell excitability. Reference will be made to channels that are important targets in neurology and cardiology, such as K⁺, Ca⁺⁺, Na⁺, Cl⁻ channels, GABA, and NMDA. • Receptors families to be studied include G protein coupled receptors, nuclear receptors, receptors with intrinsic catalytic activity etc. • The ion channels and receptors examined are drug all important targets and are examined from the perspective of modulating them pharmacologically in disease states, and understanding how modulating them leads to pharmacological response. • Important second messengers such as cyclic AMP and nitric oxide will also studied in the context of receptor activation and cell signalling. • Basic principles of molecular pharmacology are also introduced as a tool for decoding the relationship between dose and response across all families with an emphasis on the explicit nature of concepts such as potency and efficacy, competitive, non competitive inhibition, reversible and non reversible inhibition. Other pharmacological terms and their involvement in drug action such as affinity, specificity, are also examined. • Reference to personalized medicine and the use of molecular pharmacology as a tool to study single nucleotide polymorphisms (SNPs) will also be made. 										
Teaching Methodology	Face- to- face										
Bibliography	<p>Palmer Michael, Alice Chan et al. Biochemical Pharmacology Wiley 2012 Basic and Clinical Pharmacology, Katzung 12th Edition</p>										
Assessment	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">Mid – Term Examination</td> <td style="width: 30%; text-align: center;">30%</td> </tr> <tr> <td>Final Examination</td> <td style="text-align: center;">40%</td> </tr> <tr> <td>Assignments</td> <td style="text-align: center;">20%</td> </tr> <tr> <td>Class Participation</td> <td style="text-align: center;">10%</td> </tr> <tr> <td></td> <td style="text-align: center;">100%</td> </tr> </table>	Mid – Term Examination	30%	Final Examination	40%	Assignments	20%	Class Participation	10%		100%
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Language	English										