

Course Title	Precision and Personalized Medicine				
Course Code	MCB670				
Course Type	Elective				
Level	Master's (2 <sup>nd</sup> cycle)				
Year / Semester	1 <sup>st</sup> Year / 2 <sup>nd</sup> Semester				
Teacher's Name	TBA				
ECTS	10	Lectures / week	3 Hours	Laboratories / week	None
Course Purpose and Objectives	The main objective of the Precision and Personalized Medicine course is to introduce the next generation approaches of cancer medicine, based on the individual's genetic profile, which aim to provide significant benefits to patients over traditional therapeutic strategies.				
Learning Outcomes	<p>Upon completion of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Recognize the basic principles for applying data from human genome to cancer medicine</li> <li>• Describe the major -omics technologies currently used in personalized cancer medicine</li> <li>• Discuss the use of next-generation sequencing for developing personalized anti-cancer therapeutic approaches</li> <li>• Describe how transcriptomics (i.e RNA-sequencing, gene expression microarrays) and proteomics (i.e. mass spectrometry) can be applied for precision medicine.</li> <li>• Differentiate and compare the use of biological information from genomic, transcriptomic and proteomic datasets for personalized therapy in cancer.</li> <li>• Interpret big data information to evaluate the efficacy of targeted anti-cancer therapies</li> <li>• Discuss the use of cancer biomarkers in diagnosis and therapy.</li> <li>• Discuss applications of pharmacogenetics and pharmacogenomics in novel personalized drug development in cancer research</li> <li>• Discuss the principles and advantages of drug repurposing</li> <li>• Discuss ethical issues related to personalized cancer medicine</li> </ul>				
Prerequisites	None	Required	None		
Course Content	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Principles for applying human genome information to clinical practice</li> <li>• Basic technologies for developing personalized cancer medicine</li> </ul>				

	<ul style="list-style-type: none"> <li>• Applications of whole-genome sequencing for personalized cancer medicine</li> <li>• Transcriptomics and precision cancer medicine</li> <li>• Quantitative proteomics in personalized cancer therapy</li> <li>• Translating genome information into clinical practice during cancer therapy</li> <li>• Big Data and translational bioinformatics in precision and personalized cancer medicine</li> <li>• Current targeted therapies for major types of human cancer</li> <li>• Pharmacogenetics/Pharmacogenomics and precision anti-cancer drug development</li> <li>• Drug Repurposing and repositioning in cancer therapy</li> <li>• Clinical Use of biomarkers as diagnostic tools for cancer</li> <li>• Ethical social, regulatory and financial considerations for personalized cancer medicine</li> <li>• Future of personalized cancer medicine</li> </ul>										
Teaching Methodology	Face to face										
Bibliography	<p>Genomic and Precision Medicine (Foundations, Translation and Implementation), by Geoffrey Ginsburg and Huntington Willard, Latest Edition, Elsevier, ISBN: 978-0128006818</p> <p>Textbook of Personalized Medicine, by KK Jain, Springer, ISBN: 978-1441907684, Latest Edition.</p> <p>The ethics of personalized medicine – critical perspectives, by Jochen Vollmann (Author), Verena Sandow (Author), Jan Schildmann, Routledge, Latest edition, ISBN: 1472447964</p> <p>Selected scientific articles in pdf format that will be provided in advance by the lecturer</p>										
Assessment	<table> <tr> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>Final Examination</td> <td>40%</td> </tr> <tr> <td>Assignments</td> <td>20%</td> </tr> <tr> <td>Class participation</td> <td>10%</td> </tr> <tr> <td><b>Total</b></td> <td><b>100%</b></td> </tr> </table>	Mid-Term Examination	30%	Final Examination	40%	Assignments	20%	Class participation	10%	<b>Total</b>	<b>100%</b>
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Language	English										