

Program of Studies:	Master Program Bioinformatics
Name of the module:	Special-topic Lecture Biosciences: Systems Toxicology
Abbreviation:	B-M-5
Modules:	Lecture
Semester:	1 st – 3 rd , winter semester
Responsible lecturer:	Dr. Fozia Noor
Lecturer:	Dr. Fozia Noor
Language:	English
Level of the unit/ Mandatory or not :	Graduate course / mandatory elective
Course type/weekly hours:	Lecture and seminar, 2 SWS
Total workload:	90 h = 30 h of classes and 60 h private study
Credits:	3
Entrance requirements:	Basic knowledge in biochemistry, cell biology, systems biology and instrumental analytics
Aims/Competences to be developed:	Understanding complex “omics” data and the application of Systems Biology approach to toxicology and human health
Content:	<ul style="list-style-type: none"> • Use and interpretation of genomics and epigenomics data in a systems approach, genetic and genomic approaches to the identification of toxic effects, integrative analysis of microarray data, applications in systems toxicology • Proteomics, metabolomics and fluxomics: their meaning in global understanding of systems and application in drug discovery and development, application for the study of mechanisms of toxicity • <i>In vitro</i> alternatives to animal testing in toxicology, body on a chip, challenges • Systems toxicology modeling, multi scale integration of system organization, <i>in silico</i> tools for modeling, Systems toxicology modeling for prediction in humans • Application to predictive, preventive and personalized medicine, new paradigm based on systems approach to diagnostics and treatment, advances in drug discovery /biomarker discovery and drug development
Assessment/Exams:	Written exam