

Day	Session	Time	Format	Topics*	Lecturer
8 <sup>th</sup> September	Registration	8:00 - 9:00			
	Computation in life Algorithmic concepts	9:00 - 9:45	Lecture	life as an information system, the cell as a computational unit algorithms: representation, data structures and optimization	Ivan Erill (UMBC) Ivan Erill (UMBC)
		9:50 - 10:45	Lecture		
		10:45 - 11:00	<i>Coffee break</i>		
	Bioinformatics resources Essential bioinformatics	11:00 - 11:25	Lecture	bioinformatics repositories, primary vs. derivative repositories alignment, dynamic programming, search strategies, BLAST	Ivan Erill (UMBC) Cédric Notredame (CRG)
		11:30 - 13:00	Lecture		
		13:00 - 14:00	<i>Lunch</i>		
	Hands-on bioinformatics	14:00 - 14:55	Coding	Linux environment, Python, lists, versioning guided exercises on main bioinformatics repositories, BLAST flavors scripting remote queries using the NCBI API	Ivan Erill (UMBC) Ivan Erill (UMBC)  Ivan Erill (UMBC)
		15:00 - 15:45	Hands-on		
		15:45 - 16:15	<i>Coffee break</i>		
16:15 - 17:55		Coding			
9 <sup>th</sup> September	Functional genomics	9:00 - 9:50	Lecture	sequence orthology, reciprocal BLAST, functional annotation, HHMER, COG & eggNOG, functional categories guided exercises with the eggNOG database scripting the assignment and analysis of NOG identifiers	Toni Gabaldon (CRG)  Toni Gabaldon (CRG) Toni Gabaldon (CRG)
		10:00 - 10:25	Hands-on		
		10:30 - 11:45	Coding		
		11:45 - 12:00	<i>Coffee break</i>		
	Gene Ontology analysis	12:00 - 12:35	Lecture	ontologies and databases, the gene and evidence ontologies, enrichment and overrepresentation gene set enrichment and overrepresentation analyses with GO	Alex Sànchez-Pla (UB) Alex Sànchez-Pla (UB)
		12:35 - 13:00	Hands-on		
		13:00 - 14:00	<i>Lunch</i>		
	Gene Ontology analysis Systems & network biology	14:15 - 15:45	Coding	scripting the assignment and analysis of GO identifiers systems and network biology, directed and acyclic graphs, in- and out-degree, hubs and critical paths exercises with STRING and Cytoscape scripting remote STRING queries	Alex Sànchez-Pla (UB) Baldo Oliva (UPF)  Baldo Oliva (UPF) Baldo Oliva (UPF)
		15:45 - 16:30	Lecture		
		16:30 - 16:45	<i>Coffee break</i>		
16:45 - 17:15		Hands-on			
	17:15 - 18:30	Coding			

\* Topic details are for reference only