PES's Modern College of Arts, Science and Commerce (Autonomous)

Ganeshkhind, Pune 411016

MSc Bioinformatics

Course Structure NEP 2020

Class	Course Type	Course Code	Course Name	Theory/ Practical	No. of Credits	No. of Hours	CIE Marks	ESE Marks	Total Marks	Remark
MSc Bioinformatics I (Semester I)	DSC Major	BNF 5111	Biomolecular Structure & Organization	T	2	30L	20	30	50	
		BNF 5112	Biological Data & Databases	T	2	30L	20	30	50	
		BNF 5113	Biological Sequence Analysis	T	2	30L	20	30	50	
		BNF 5114	Biological Data, Databases and Biological Sequence Analysis Lab	P	2	15P	20	30	50	
		BNF 5115	Computer programming for Bioinformatics Lab	P	2	15P	20	30	50	
	DSE	BNF 5121*	Mathematics & Statistics	T	2	30L	20	30	50	*Courses worth of 8 credits from among the following*
		BNF 5122*	Mathematics & Statistics Lab	P	2	15P	20	30	50	
		BNF 5123*	Basic Biology and Biochemistry	T	2	30L	20	30	50	
		BNF 5124*	Basic Biology and Biochemistry Lab	P	2	15P	20	30	50	
		BNF 5125	Cell and Molecular Biology	T	2	30L	20	30	50	
		BNF 5126	Cell and Molecular Biology Lab	P	2	15P	20	30	50	
		BNF 5127	Introduction to Bioinformatics	T	2	30L	20	30	50	
		BNF 5128	Introduction to Bioinformatics Lab	P	2	15P	20	30	50	
	RM	BNF 5131	Research Methodology	T	2	30L	20	30	50	
		BNF 5132	Research Methodology Lab	P	2	15P	20	30	50	

*** Depending upon the UG training background, the students coming from Biology, Chemistry and all streams other than Mathematics and Statistics may opt for the course BNF 5121 and BNF 5122 Mathematics & Statistics and Mathematics & Statistics Lab. The students coming from Mathematics and Statistics streams may opt for BNF 5123 and BNF 5124 Basic Biology and Biochemistry and Basic Biology and Biochemistry Lab.**

Class	Course Type	Course Code	Course Name	Theory/ Practical	No. of Credits	No. of Hours	CIE Marks	ESE Marks	Total Marks	Remark
MSc Bioinformatics I (Semester II)	DSC Major	BNF 5211	Structural Bioinformatics and molecular modelling	T	2	30L	20	30	50	
		BNF 5212	Structural Bioinformatics and molecular modelling Lab	P	2	15P	20	30	50	
		BNF 5213	Programming in Java Lab	P	2	15P	20	30	50	
		BNF 5214	OMICs	T	4	60L	40	60	100	
		BNF 5215	Big Data Analysis- Data science and Database Management	T	2	30L	20	30	50	
		BNF 5216	Big Data Analysis- Data science and Database Management Lab	P	2	15P	20	30	50	
	DSE	BNF 5221	Biological Data Curation and Analysis Lab	P	2	15P	20	30	50	*Courses worth of 4 credits from among the following*
		BNF 5222	Advanced Techniques in Experimental Biology Lab	P	2	15P	20	30	50	
		BNF 5223	Molecular Phylogenetics Lab	P	2	15P	20	30	50	
		BNF 5224	Linux Operating System Lab	P	2	15P	20	30	50	
	OJT	BNF 5231	On Job Training/ Field Project	P	4	-	40	60	100	

Class	Course Type	Course Code	Course Name	Theory/ Practical	No. of Credits	No. of Hours	CIE Marks	ESE Marks	Total Marks	Remark
MSc Bioinformatics II (Semester III)	DSC Major	BNF 6311	Immunology and Immunoinformatics	T	2	30L	20	30	50	
		BNF 6312	Chemo-informatics and Agri-informatics	T	2	30L	20	30	50	
		BNF 6313	Chemo-informatics and Agri-informatics Lab	P	2	15P	20	30	50	
		BNF 6314	Molecular Modelling and Drug Designing	T	2	30L	20	30	50	
		BNF 6315	Molecular Modelling and Drug Designing Lab	P	2	15P	20	30	50	
		BNF 6316	Scientific Data Mining and Visualization	T	2	30L	20	30	50	
		BNF 6317	Scientific Data Mining and Visualization Lab	P	2	15P	20	30	50	
	DSE	BNF 6321	Molecular basis of diseases	T	2	30L	20	30	50	*Courses worth 4 credits from among the following*
		BNF 6322	Immunology Lab	P	2	15P	20	30	50	
		BNF 6323	Web Design Lab	P	2	15P	20	30	50	
	RP	BNF 6331	Research Project	P	4	-	40	60	100	

Class	Course Type	Course Code	Course Name	Theory/ Practical	No. of Credits	No. of Hours	CIE Marks	ESE Marks	Total Marks	Remark
MSc Bioinformatics II (Semester IV)	DSC Major	BNF 6411	Advanced Algorithms and Machine Learning	T	2	30L	20	30	50	
		BNF 6412	Advanced Algorithms and Machine Learning Lab	P	2	15P	20	30	50	
		BNF 6413	Transcriptomics and Proteomics	T	2	30L	20	30	50	
		BNF 6414	Transcriptomics and Proteomics Lab	P	2	15P	20	30	50	
		BNF 6415	Metabolic Engineering & Systems Biology	T	2	30L	20	30	50	
		BNF 6416	Metabolic Engineering & Systems Biology Lab	P	2	15P	20	30	50	
	DSE	BNF 6421	Translational Bioinformatics	T	2	30L	20	30	50	*Courses worth 4 credits from among the following*
		BNF 6422	Advanced Genomics Lab	P	2	15P	20	30	50	
		BNF 6423	Pathways and Networking Lab	P	2	15P	20	30	50	
	RP	BNF 6431	Research Project	P	6	-	60	90	150	