M.Sc. in Computational Science and Applications

(with specialization in Data Science or Software Engineering or Signal Processing)

DST-Centre for Interdisciplinary Mathematical Sciences (CIMS), Institute of Science, Banaras Hindu University

DISTRIBUTION OF COURSES AND CREDITS IN VARIOUS SEMESTERS

Year	*Course Code*	*Course Title*	*Credits*
1st		***SEMESTER I***	
	CSA101	Programming Languages with Introduction to C and Java	03
	CSA102	Database Management Systems	03
	CSA103	Discrete Mathematics	03
	CSA104	Probability Theory and distributions	03
	CSA105	Statistical Inference and Data Analysis	03
	CSA106	Practical	04
		Total	**19**
		SEMESTER II	
	CSA201	Data Structure	03
	CSA202	Design and Analysis of Algorithms	03
	CSA203	Software Engineering	03
	CSA204	Bayesian Statistics	03
	CSA205	Artificial Intelligence	03
	CSA206	SWAYAM Course	02
	CSA207	Practical	03
		Total	**20**
2nd		***SEMESTER III***	
	CSA301	Theory of Computation	03

	CSA302	SWAYAM Course	02
	CSA303	Machine Learning	03
	CSA304	Programming with R and Python	03
	CSA305	Practical	03
	CSA306	Dissertation-I	01
		Elective Course: Select Any Two of the following	
	CSA307	Computer Organization and Architecture	03
	CSA308	Data Communication and Computer Networks	03
	CSA309	Analysis of Multivariate Data	03
	CSA310	Statistical Data Mining-I	03
	CSA311	Digital Signal Processing	03
	CSA312	Image Processing	03
	CSA313	Advanced Software Engineering	03
	CSA314	Software Metrics	03
	CSA315	Graph Theory and Its Applications	03
		Total	**21**
		SEMESTER IV	
	CSA401	Dissertation-II	04
		Elective Course: Select Any Four of the following	
	CSA402	System Software and Operating System	04
	CSA403	Compiler Design	04
	CSA404	Computer Graphics	04
	CSA405	High Performance Computing	04
	CSA406	Longitudinal Data Analysis	04

	CSA407	Big Data Analytics	04
	CSA408	Advanced Machine Learning	04
	CSA409	Statistical Data Mining-II	04
	CSA410	Deep Learning for Natural Language Processing	04
	CSA411	Introduction to Pattern Recognition	04
	CSA412	Inverse Problems	04
	CSA413	Image Analysis & Computer Vision	04
	CSA414	Software Testing and Quality Assurance	04
	CSA415	Software Process and Project Management	04
	CSA416	Software Dependability and Security	04
		Total	**20**
	Total Credits		**80**

There shall be sessionals / tutorials / class tests / seminars in class / group discussions in each theory and practical paper except CSA306: Dissertation-I in semester - III and CSA401: Dissertation-II in Semester – IV.

If a candidate selects courses as categorized below he/she will be given any of the following specialization otherwise degree in M.Sc. Computational Science and Applications without any specialization will be given.

Specialization1: Data Science

If a candidate selects the following courses in semester -III

Course No Title of the Course

CSA309: Analysis of Multivariate Data
CSA310: Statistical Data Mining-I

If a candidate selects any three from the following courses in Semester -IV:

Course No Title of the Course

CSA405: High Performance Computing
CSA406: Longitudinal Data Analysis
CSA407: Big Data Analytics
CSA408: Advanced Machine Learning
CSA409: Statistical Data Mining-II
CSA410: Deep Learning for Natural Language Processing
Note: One more course in the 4th semester can be selected based on his/her choice.