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**NATIONAL INSTITUTE OF TECHNOLOGY, Bhopal-462003**  
**DEPARTMENT OF MATHEMATICS, BIOINFORMATICS &**  
**COMPUTER APPLICATIONS**  
**Master of Computer Applications**  
**SCHEME OF STUDY (Revised April 2020)**

**First Semester**

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
<b>MTH 101 CA</b>	Discrete Mathematics	3	1	---	4
<b>CA 102</b>	Computer Architecture & System Software	3	--	--	3
<b>CA 103</b>	Data Structures	3	--	2	4
<b>CA 104</b>	Operating System	3	--	--	3
<b>CA 105</b>	C Programming	3	--	--	3
<b>HUM 106 CA</b>	Business Communication	3	1	---	4
<b>CA 107</b>	Web Development Lab- I	---	---	4	2
<b>CA 108</b>	Programming Lab in C	---	---	6	3
<b>Total Hours 32</b>		<b>Total Credits</b>			<b>26</b>
<b>Total Credits (Cumulative) 26</b>					

**Second Semester**

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
<b>MTH 201 CA</b>	Linear Algebra	3	1	---	4
<b>CA 202</b>	Software Engineering	3	1	--	4
<b>CA 203</b>	Computer Networks	3	--	--	3
<b>CA 204</b>	Database Management System	3	1	--	4
<b>CA 205</b>	Object Oriented Design Using UML	3	--	--	3
<b>CA 206</b>	Python Programming	3	--	--	3
<b>CA 207</b>	Web Development Lab- II	---	---	4	2
<b>CA 208</b>	Programming Lab in Python	---	---	6	3
<b>Total Hours 31</b>		<b>Total Credits</b>			<b>26</b>
<b>Total Credits (Cumulative) 52</b>					

### Third Semester

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
<b>MTH 301 CA</b>	Probability & Applied Statistics	3	1	---	4
<b>CA 302</b>	Software Architecture	3	--	--	3
<b>CA 303</b>	Analysis & Design of Algorithm	3	--	--	3
<b>CA 304</b>	Application Development using JAVA	3	--	--	3
<b>CA 305</b>	Enterprise Resource Planning and Supply Chain Management	3	1	---	4
<b>CA 306</b>	Development and Operational Tools (Devops)	-	1	4	3
<b>CA 307</b>	Programming Lab in JAVA	--	--	4	2
<b>CA 308</b>	Minor Project – I	--	--	8	4
<b>Total Hours 34</b>		<b>Total Credits</b>			<b>26</b>
<b>Total Credits (Cumulative) 78</b>					

### Fourth Semester

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
<b>MTH 401 CA</b>	Optimization Methods for Analytics	3	1	---	4
<b>CA 402</b>	Data Warehousing and Data Mining	3	--	---	3
<b>CA 403</b>	Artificial Intelligence & Neural Network	3	---	--	3
<b>CA 404</b>	Service Management	3	1	---	4
<b>CA 405</b>	Data Science	3	1	--	4
	Elective – I	3	--	--	3
	Elective Lab- I	---		4	2
<b>CA 406</b>	Minor Project - II	---	---	6	3
<b>Total Hours 31</b>		<b>Total Credits</b>			<b>26</b>
<b>Total Credits (Cumulative) 104</b>					

### Fifth Semester

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
CA 501	Cloud Computing & Virtualization	3	1	---	4
CA 502	Machine Learning	3	--	2	4
CA 503	Big Data & Analytics	3	--	2	4
	Elective – II	3	1	---	4
	Elective – III	3	1	---	4
	Elective Lab-II	---	---	4	2
CA 504	Minor Project - III	---	---	8	4
<b>Total Hours 34</b>		<b>Total Credits</b>			<b>26</b>
<b>Total Credits (Cumulative) 130</b>					

### Sixth Semester

Course No.	Subjects	Scheme of studies period per week			Total Credits
		L	T	P	
CA 601	Dissertation (Major Project)	--	---	40	20
<b>Total Hours 40</b>		<b>Total Credits</b>			<b>20</b>
<b>Total Credits (Cumulative) 150</b>					

### List of Electives

<b><u>Electives (Theory)</u></b>	CA-701– Internet of Things CA-702 - Software Project Management CA-703 - Mobile Application Development CA 704 – Design Patterns CA-801 User Interface Design CA-802 Natural Language Processing CA-803 Deep learning CA-804 Information Retrieval CA-805 Computer Graphics CA-806 Block Chain CA-901 Service Oriented Architecture CA-902 Robotics Process Automation CA-903 Software Testing Methodologies & Tools CA-904 Next Generation Networks CA-905 Information Security CA-906 Multimedia & Virtual Reality
<b><u>Electives (Labs)</u></b>	CA-705 – Mobile Application Development Lab CA-706 - Internet of Things Lab CA-707 - Computer Aided Software Engineering Tools Lab CA-708- Design Pattern Lab CA-807 – Next Generation Networks Lab CA-808 - Machine Learning & Deep Learning Lab CA-809 - Big Data & Virtualization Lab CA-810- Information Retrieval Lab CA-811- Software Testing Lab