

**M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT
MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)
(Accredited by NAAC with Grade 'A++')**

**SCHEME OF EXAMINATION FOR BCA WITH SPECIALIZATION IN
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (NEP-2020)**

BCA – 1st Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-101	Programming in C	3	-	-	3.0	40	60	-	100
2.	Core	BCA-102	Computer Fundamentals & MS Office	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-103	Digital Electronics	3	1	-	4.0	40	60	-	100
4.	Core	BCA-104	Introduction to Information Technology	4	-	-	4.0	40	60	-	100
5.	Ability Enhancement Course-I	BHUM - 011	English	3	-	-	3.0	40	60	-	100
6.	General	HSMC-051	Universal Human Values	3	-	-	3.0	40	60	-	100
7.	Core	BCA-105	C Lab.	-	-	2	1.0	60	-	40	100
8.	Core	BCA-106	MS Office Lab.	-	-	2	1.0	60	-	40	100
			Total	19	1	4	22.0	360	360	80	800

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 2nd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-201	Object Oriented Programming using C++	3	-	-	3.0	40	60	-	100
2.	Core	BCA-202	Data Structure	4	-	-	4.0	40	60	-	100
3.	Core	BCA-203	System Analysis & Design	3	1	-	4.0	40	60	-	100
4.	General	BHUM-013	Hindi	3	-	-	3.0	40	60	-	100
5.	Ability Enhancement Course-II	ES - 101	Environment Studies	4	-	-	4.0	40	60	-	100
6.	Core	BCA-204	C++ Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-205	Data Structure Lab.	-	-	2	1.0	60	-	40	100
8.	General	BCA-206	Seminar-I	1	-	-	1.0	100	-	-	100
9.	Activity	CUL-001/ SPO-001/ HLY-001	Cultural/ Sports/ Health & Yoga	-	-	2	1.0	100	-	-	100
			Total	18	1	6	22.0	520	300	80	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 3rd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-301	Database Management System	3	-	-	3.0	40	60	-	100
2.	Core	BCA-302	Web Designing Fundamentals	3	-	-	3.0	40	60	-	100
3.	Core	BCA-303	Computer System Architecture	3	1	-	4.0	40	60	-	100
4.	Interdisciplinary	BCA-304	Mathematical Foundation	3	1	-	4.0	40	60	-	100
5.	Skill Enhancement Course	BCA-305	Data Communication & Networking	4	-	-	4.0	40	60	-	100
6.	Core	BCA-306	DBMS Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-307	Web Designing Lab.	-	-	2	1.0	60	-	40	100
8.	Interdisciplinary	BHUM-022	English Communication Lab.	-	-	2	1.0	60	-	40	100
9.	Activity	NSS-001/ NCC-001	NSS/ NCC	-	-	2	1.0	100	-	-	100
			Total	16	2	8	22.0	480	300	120	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 4th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-401	Java Programming	3	-	-	3.0	40	60	-	100
2.	Skill Enhancement Course	BCA-402	Open Source Programming	3	-	-	3.0	40	60	-	100
3.	Core	BCA-403	Operating System	3	1	-	4.0	40	60	-	100
4.	Core	BCA-404	Software Engineering	3	-	-	3.0	40	60	-	100
5.	Interdisciplinary	BCIV-080	Disaster Management	3	-	-	3.0	40	60	-	100
6.	Core	BCA-405	Java Lab.	-	-	2	1.0	60	-	40	100
7.	Skill Enhancement Course	BCA-406	Open Source Programming Lab.	-	-	2	1.0	60	-	40	100
8.	General	MAN-001	Indian Constitution	3	-	-	3.0	40	60	-	100
9.	Specialization	BCA-408	Project-I	-	-	2	1.0	60	-	40	100
			Total	18	1	6	22.0	420	360	120	900

- Note:**
1. Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.
 2. Students have to undergo a mandatory summer training of 6 weeks after the examinations of 4th semester of 6 credits. If the student want to exit after 2nd year, the viva-voce examination

of the training will be held after completion of training otherwise the same will be held during BCA-5th semester.

- If the student want to exit after 1st year, he/she will be eligible to get the certificate after completing the mandatory summer training of 6 weeks of 6 credits.

BCA – 5th Semester

Sr. No	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-501	Artificial Intelligence	3	-	-	3.0	40	60	-	100
2.	Core	BCA-502	Python Programming	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-503	Statistical Methods	3	1	-	4.0	40	60	-	100
4.	Discipline Specific Elective	BCA-504	Elective-I	3	-	-	3.0	40	60	-	100
5.	Discipline Specific Elective	BCA-505	Elective-II	3	1	-	4.0	40	60	-	100
6.	Specialization	BCA-506	Artificial Intelligence Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-507	Python Programming Lab.	-	-	2	1.0	60	-	40	100
8.	Specialization	BCA-508	Project-II	-	-	2	1.0	60	-	40	100
9.	Activity	BHUM-003	Entrepreneurship Development & Management	3	1	-	4.0	40	60	-	100
10.	Core	BCA-509	Training Viva-Voce	-	-	-	6.0	60	-	40	100
			Total	18	3	6	30.0	480	360	160	1000

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

Student can choose any one of the following electives for BCA-504 and BCA-505:

Elective – I

- BCA-504 (a): Natural Language Processing
- BCA-504 (b): Soft Computing
- BCA-504 (c): Neural Networks and Fuzzy Logic

Elective – II

- BCA-505 (a): Deep Learning
- BCA-505 (b): Data Warehousing & Data Mining
- BCA-505 (c): Data Visualization

BCA – 6th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	R Programming	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-602	Machine Learning	3	-	-	3.0	40	60	-	100
3.	Discipline Specific Elective	BCA-603	Elective-III	3	1	-	4.0	40	60	-	100
4.	Specialization	BCA-604	R Programming	-	-	2	1.0	60	-	40	100

			Lab.								
5.	Specialization	BCA-605	Machine Learning Lab.	-	-	2	1.0	60	-	40	100
6.	Specialization	BCA-606	Project-III	-	-	2	1.0	60	-	40	100
7.	Activity	CUL-002/ SPO-002/ HLY-002	Cultural/ Sports/ Health & Yoga	-	-	2	1.0	100	-	-	100
			Total	9	1	8	14.0	400	180	120	700

Student can choose any one of the following electives for BCA-603:

Elective – III

- i) BCA-603 (a): Cloud Computing
- ii) BCA-603 (b): Cyber Security
- iii) BCA-603 (c): Internet of Things

OR

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	Industrial Project	-	-	-	14.0	100	-	200	300
			Total	-	-	-	14.0	100	-	200	300

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 7th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Generic	BCA-701	Research Methodology	4	-	-	4.0	40	60	-	100
2.	Generic	BCA-702	Research Publication & Ethics	4	-	-	4.0	40	60	-	100
3.	Core	BCA-703	Departmental Elective (Research Based)	4	-	-	4.0	40	60	-	100
4.	Skill Enhancement	BCA-704	Synopsis Writing & Presentation	2	-	-	2.0	100	-	-	100
5.	Specialization	BCA-705	Seminar (Based on Literature Review and Data Collection)	2	-	-	2.0	100	-	-	100
			Total	16	-	-	16.0	320	180	-	500

BCA – 8th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-801	Research & Thesis Writing	-	-	-	12.0	100	-	-	200
			Total	-	-	-	12.0	100	-	-	200

**M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT
MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)
(Accredited by NAAC with Grade 'A++')**

**SCHEME OF EXAMINATION FOR BCA WITH SPECIALIZATION IN
DATA SCIENCE (NEP-2020)**

BCA – 1st Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-101	Programming in C	3	-	-	3.0	40	60	-	100
2.	Core	BCA-102	Computer Fundamentals & MS Office	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-103	Digital Electronics	3	1	-	4.0	40	60	-	100
4.	Core	BCA-104	Introduction to Information Technology	4	-	-	4.0	40	60	-	100
5.	Ability Enhancement Course-I	BHUM - 011	English	3	-	-	3.0	40	60	-	100
6.	General	HSMC-051	Universal Human Values	3	-	-	3.0	40	60	-	100
7.	Core	BCA-105	C Lab.	-	-	2	1.0	60	-	40	100
8.	Core	BCA-106	MS Office Lab.	-	-	2	1.0	60	-	40	100
			Total	19	1	4	22.0	360	360	80	800

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 2nd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-201	Object Oriented Programming using C++	3	-	-	3.0	40	60	-	100
2.	Core	BCA-202	Data Structure	4	-	-	4.0	40	60	-	100
3.	Core	BCA-203	System Analysis & Design	3	1	-	4.0	40	60	-	100
4.	General	BHUM-013	Hindi	3	-	-	3.0	40	60	-	100
5.	Ability Enhancement Course-II	ES - 101	Environment Studies	4	-	-	4.0	40	60	-	100
6.	Core	BCA-204	C++ Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-205	Data Structure Lab.	-	-	2	1.0	60	-	40	100
8.	General	BCA-206	Seminar-I	1	-	-	1.0	100	-	-	100
9	Activity	CUL-001/ SPO-001/ HLY-001	Cultural/ Sports/ Health & Yoga	-	-	2	1.0	100	-	-	100
			Total	18	1	6	22.0	520	300	80	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 3rd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-301	Database Management System	3	-	-	3.0	40	60	-	100
2.	Core	BCA-302	Web Designing Fundamentals	3	-	-	3.0	40	60	-	100
3.	Core	BCA-303	Computer System Architecture	3	1	-	4.0	40	60	-	100
4.	Interdisciplinary	BCA-304	Mathematical Foundation	3	1	-	4.0	40	60	-	100
5.	Skill Enhancement Course	BCA-305	Data Communication & Networking	4	-	-	4.0	40	60	-	100
6.	Core	BCA-306	DBMS Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-307	Web Designing Lab.	-	-	2	1.0	60	-	40	100
8.	Interdisciplinary	BHUM-022	English Communication Lab	-	-	2	1.0	60	-	40	100
9.	Activity	NSS-001/ NCC-001	NSS/NCC	-	-	2	1.0	100	-	-	100
			Total	16	2	8	22.0	480	300	120	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 4th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-401	Java Programming	3	-	-	3.0	40	60	-	100
2.	Skill Enhancement Course	BCA-402	Python Programming	3	-	-	3.0	40	60	-	100
3.	Core	BCA-403	Operating System	3	1	-	4.0	40	60	-	100
4.	Core	BCA-404	Software Engineering	3	-	-	3.0	40	60	-	100
5.	Interdisciplinary	BCIV-080	Disaster Management	3	-	-	3.0	40	60	-	100
6.	Core	BCA-405	Java Lab.	-	-	2	1.0	60	-	40	100
7.	Skill Enhancement Course	BCA-406	Python Programming Lab.	-	-	2	1.0	60	-	40	100
8.	General	MAN-001	Indian Constitution	3	-	-	3.0	40	60	-	100
9.	Specialization	BCA-408	Project-I	-	-	2	1.0	60	-	40	100
			Total	18	1	6	22.0	420	360	120	900

Note:

1. Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.
2. Students have to undergo a mandatory summer training of 6 weeks after the examinations of 4th semester of 6 credits. If the student want to exit after 2nd year, the viva-voce examination **BCA (Data Science) Scheme under CBCS (NEP-2020) w.e.f Batch 2022-25 onwards**

of the training will be held after completion of training otherwise the same will be held during BCA-5th semester.

- If the student want to exit after 1st year, he/she will be eligible to get the certificate after completing the mandatory summer training of 6 weeks of 6 credits.

BCA – 5th Semester

Sr. No	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-501	R Programming	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-502	Data Science and Analytics	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-503	Statistical Methods	3	1	-	4.0	40	60	-	100
4.	Discipline Specific Elective	BCA-504	Elective-I	3	-	-	3.0	40	60	-	100
5.	Discipline Specific Elective	BCA-505	Elective-II	3	1	-	4.0	40	60	-	100
6.	Core	BCA-506	R Programming Lab.	-	-	2	1.0	60	-	40	100
7.	Specialization	BCA-507	Data Science and Analytics Lab.	-	-	2	1.0	60	-	40	100
8.	Specialization	BCA-508	Project-II	-	-	2	1.0	60	-	40	100
9.	Activity	BHUM-003	Entrepreneurship Development & Management	3	1	-	4.0	40	60	-	100
10.	Core	BCA-509	Training Viva-Voce	-	-	-	6.0	60	-	40	100
			Total	18	3	6	30.0	480	360	160	1000

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

Student can choose any one of the following electives for BCA-504 and BCA-505:

Elective – I

- BCA-504 (a): Cloud Computing
- BCA-504 (b): E-Commerce
- BCA-504 (c): Software Quality & Testing

Elective – II

- BCA-505 (a): Soft Computing
- BCA-505 (b): Data Warehousing & Data Mining
- BCA-505 (c): Cyber Security

BCA – 6th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	NoSQL Database	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-602	Data Visualization	3	-	-	3.0	40	60	-	100
3.	Discipline Specific Elective	BCA-603	Elective-III	3	1	-	4.0	40	60	-	100
4.	Specialization	BCA-604	NoSQL Database Lab.	-	-	2	1.0	60	-	40	100

5.	Specialization	BCA-605	Data Visualization Lab.	-	-	2	1.0	60	-	40	100
6.	Specialization	BCA-606	Project-III	-	-	2	1.0	60	-	40	100
7.	Activity	CUL-002/SPO-002/HLY-002	Cultural/ Sports/ Heath & Yoga	-	-	2	1.0	100	-	-	100
Total				9	1	8	14.0	400	180	120	700

Student can choose any one of the following electives for BCA-603:

Elective – III

- i) BCA-603 (a): Machine learning
- ii) BCA-603 (b): Big Data Analytics
- iii) BCA-603 (c): Internet of Things

OR

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	Industrial Project	-	-	-	14	100	-	200	300
Total				-	-	-	14	100	-	200	300

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 7th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Generic	BCA-701	Research Methodology	4	-	-	4.0	40	60	-	100
2.	Generic	BCA-702	Research Publication & Ethics	4	-	-	4.0	40	60	-	100
3.	Core	BCA-703	Departmental Elective (Research Based)	4	-	-	4.0	40	60	-	100
4.	Skill Enhancement	BCA-704	Synopsis Writing & Presentation	2	-	-	2.0	100	-	-	100
5.	Specialization	BCA-705	Seminar (Based on Literature Review and Data Collection)	2	-	-	2.0	100	-	-	100
Total				16	-	-	16.0	320	180	-	500

BCA – 8th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-801	Research & Thesis Writing	-	-	-	12.0	100	-	-	200
Total				-	-	-	12.0	100	-	-	200

M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT
MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)
 (Accredited by NAAC with Grade 'A++')

SCHEME OF EXAMINATION FOR BCA (NEP-2020)

BCA – 1st Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-101	Programming in C	3	-	-	3.0	40	60	-	100
2.	Core	BCA-102	Computer Fundamentals & MS Office	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-103	Digital Electronics	3	1	-	4.0	40	60	-	100
4.	Core	BCA-104	Introduction to Information Technology	4	-	-	4.0	40	60	-	100
5.	Ability Enhancement Course-I	BHUM - 011	English	3	-	-	3.0	40	60	-	100
6.	General	HSMC-051	Universal Human Values	3	-	-	3.0	40	60	-	100
7.	Core	BCA-105	C Lab.	-	-	2	1.0	60	-	40	100
8.	Core	BCA-106	MS Office Lab.	-	-	2	1.0	60	-	40	100
			Total	19	1	4	22.0	360	360	80	800

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 2nd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-201	Object Oriented Programming using C++	3	-	-	3.0	40	60	-	100
2.	Core	BCA-202	Data Structure	4	-	-	4.0	40	60	-	100
3.	Core	BCA-203	System Analysis & Design	3	1	-	4.0	40	60	-	100
4.	General	BHUM-013	Hindi	3	-	-	3.0	40	60	-	100
5.	Ability Enhancement Course-II	ES - 101	Environment Studies	4	-	-	4.0	40	60	-	100
6.	Core	BCA-204	C++ Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-205	Data Structure Lab.	-	-	2	1.0	60	-	40	100
8.	General	BCA-206	Seminar-I	1	-	-	1.0	100	-	-	100
9	Activity	CUL-001/ SPO-001/ HLY-001	Cultural/ Sports/ Health & Yoga	-	-	2	1.0	100	-	-	100
			Total	18	1	6	22.0	520	300	80	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 3rd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-301	Database Management System	3	-	-	3.0	40	60	-	100
2.	Core	BCA-302	Web Designing Fundamentals	3	-	-	3.0	40	60	-	100
3.	Core	BCA-303	Computer System Architecture	3	1	-	4.0	40	60	-	100
4.	Interdisciplinary	BCA-304	Mathematical Foundation	3	1	-	4.0	40	60	-	100
5.	Core	BCA-305	Data Communication & Networking	4	-	-	4.0	40	60	-	100
6.	Core	BCA-306	DBMS Lab.	-	-	2	1.0	60	-	40	100
7.	Core	BCA-307	Web Designing Lab.	-	-	2	1.0	60	-	40	100
8.	Interdisciplinary	BHUM-022	English Communication Lab	-	-	2	1.0	60	-	40	100
9.	Activity	NSS-001/ NCC-001	NSS/ NCC	-	-	2	1.0	100	-	-	100
			Total	16	2	8	22.0	480	300	120	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 4th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-401	Java Programming	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-402	Open Source Programming	3	-	-	3.0	40	60	-	100
3.	Core	BCA-403	Operating System	3	1	-	4.0	40	60	-	100
4.	Core	BCA-404	Software Engineering	3	-	-	3.0	40	60	-	100
5.	Interdisciplinary	BCIV-080	Disaster Management	3	-	-	3.0	40	60	-	100
6.	Core	BCA-405	Java Lab.	-	-	2	1.0	60	-	40	100
7.	Specialization	BCA-406	Open Source Programming Lab.	-	-	2	1.0	60	-	40	100
8.	General	MAN-001	Indian Constitution	3	-	-	3.0	40	60	-	100
9.	Specialization	BCA-407	Project-I	-	-	2	1.0	60	-	40	100
			Total	18	1	6	22.0	420	360	120	900

- Note:**
1. Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.
 2. Students have to undergo a mandatory summer training of 6 weeks after the examinations of 4th semester of 6 credits. If the student want to exit after 2nd year, the viva-voce examination

of the training will be held after completion of training otherwise the same will be held during BCA-5th semester.

3. If the student want to exit after 1st year, he/she will be eligible to get the certificate after completing the mandatory summer training of 6 weeks of 6 credits.

BCA – 5th Semester

Sr. No	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	BCA-501	Python Programming	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-502	Mobile Application Development	3	-	-	3.0	40	60	-	100
3.	Interdisciplinary	BCA-503	Statistical Methods	3	1	-	4.0	40	60	-	100
4.	Discipline Specific Elective	BCA-504	Elective-I	3	-	-	3.0	40	60	-	100
5.	Discipline Specific Elective	BCA-505	Elective-II	3	1	-	4.0	40	60	-	100
6.	Core	BCA-506	Python Programming Lab.	-	-	2	1.0	60	-	40	100
7.	Specialization	BCA-507	Mobile Application Development Lab.	-	-	2	1.0	60	-	40	100
8.	Specialization	BCA-508	Project-II	-	-	2	1.0	60	-	40	100
9.	Activity	BHUM-003	Entrepreneurship Development & Management	3	1	-	4.0	40	60	-	100
10.	Core	BCA-509	Training viva-voce	-	-	-	6.0	60	-	40	100
			Total	18	3	6	30.0	480	360	160	1000

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

Student can choose any one of the following electives for BCA-504 and BCA-505:

Elective – I

- i) BCA-504 (a): Software Project Management
- ii) BCA-504 (b): E-Commerce
- iii) BCA-504 (c): Software Quality & Testing

Elective – II

- i) BCA-505 (a): Computer Graphics
- ii) BCA-505 (b): Data Warehousing & Data Mining
- iii) BCA-505 (c): Compiler Construction

BCA – 6th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	R Programming	3	-	-	3.0	40	60	-	100
2.	Specialization	BCA-602	Cloud Computing	3	-	-	3.0	40	60	-	100
3.	Discipline Specific Elective	BCA-603	Elective-III	3	1	-	4.0	40	60	-	100
4.	Specialization	BCA-604	R Programming Lab.	-	-	2	1.0	60	-	40	100
5.	Specialization	BCA-605	Cloud Computing Lab.	-	-	2	1.0	60	-	40	100
6.	Specialization	BCA-606	Project-III	-	-	2	1.0	60	-	40	100
7.	Activity	CUL-001/ SPO-001/ HLY-001	Cultural/ Sports/ Health & Yoga	-	-	2	1.0	100	-	-	100
Total				9	1	8	14.0	400	180	120	700

Student can choose any one of the following electives for BCA-603:

Elective – III

- i) BCA-603 (a): Internet of Things
- ii) BCA-603 (b): Cyber Security
- iii) BCA-603 (c): Artificial Intelligence

OR

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-601	Industrial Project	-	-	-	14.0	100	-	200	300
Total				-	-	-	14.0	100	-	200	300

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits and course category of the replaced subject.

BCA – 7th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Generic	BCA-701	Research Methodology	4	-	-	4.0	40	60	-	100
2.	Generic	BCA-702	Research Publication & Ethics	4	-	-	4.0	40	60	-	100
3.	Core	BCA-703	Departmental Elective (Research Based)	4	-	-	4.0	40	60	-	100
4.	Skill Enhancement	BCA-704	Synopsis Writing & Presentation	2	-	-	2.0	100	-	-	100
5.	Specialization	BCA-705	Seminar (Based on Literature Review and Data Collection)	2	-	-	2.0	100	-	-	100
Total				16	-	-	16.0	320	180	-	500

BCA – 8th Semester

BCA Scheme under CBCS (NEP-2020) w.e.f Batch 2022-25 onwards

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	BCA-801	Research & Thesis Writing	-	-	-	12.0	100	-	-	200
			Total	-	-	-	12.0	100	-	-	200

M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT
MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY), MULLANA
(Accredited by NAAC with Grade 'A++')

MCA – 1st Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	MCA-101	Data Structure using C++	4	-	-	4.0	40	60	-	100
2.	Core	MCA-102	Advanced Database Management System	4	-	-	4.0	40	60	-	100
3.	Core	MCA-103	Operating System	3	1	-	4.0	40	60	-	100
4.	Core	MCA-104	Software Engineering	3	1	-	4.0	40	60	-	100
5.	Core	MCA-105	Business Intelligence and its Applications	4	-	-	4.0	40	60	-	100
6.	Core	MCA-106	Data Structure using C++ Lab.	-	-	2	1.0	60	-	40	100
7.	Core	MCA-107	Advanced Database Management System Lab.	-	-	2	1.0	60	-	40	100
8.	General	MCA-108	Seminar-I	1	-	-	1.0	100	-	-	100
			Total	19	2	4	23.0	420	300	80	800

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Bridge Course*	MCA-B101	Computer Fundamentals and Web Design	3	-	-	-	40	60	-	100

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits of the replaced subject.

MCA – 2nd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	MCA-201	Object Oriented Programming using Java	4	-	-	4.0	40	60	-	100
2.	Skill Enhancement Course	MCA-202	Web Technologies	4	-	-	4.0	40	60	-	100
3.	Core	MCA-203	Data Communication & Networking	3	1	-	4.0	40	60	-	100
4.	Core	MCA-204	Software Testing and Quality Assurance	3	1	-	4.0	40	60	-	100
5.	General	MCA-205	Digital Marketing	3	-	-	3.0	40	60	-	100
6.	Core	MCA-206	Object Oriented Programming using Java Lab.	-	-	2	1.0	60	-	40	100
7.	Skill Enhancement	MCA-207	Web Technologies Lab.	-	-	2	1.0	60	-	40	100

	Course										
8.	Specialization	MCA-208	Project-I	-	-	2	1.0	60	-	40	100
			Total	17	2	6	22.0	380	300	120	800

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examinational Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Bridge Course*	MCA-B201	Logical Organization of Computers	3	-	-	-	40	60	-	100
2.	Bridge Course*	MCA-B202	Fundamentals of Mathematics	3	1	-	-	40	60	-	100

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits of the replaced subject.

* Bridge course is only for the students having no Mathematics or Computer background. Students are required to qualify these courses also. These courses will be of qualifying in nature and shall not be considered towards semester total of marks.

Note: All the students have to undergo a mandatory industry internship of 6-weeks after MCA-2nd semester examinations. A report shall be submitted to the institute by every student at the completion of the internship. The presentation/ viva-voce examination of the industry internship will be held during MCA-3rd semester.

MCA – 3rd Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Core	MCA-301	Programming with Python	4	-	-	4.0	40	60	-	100
2.	Core	MCA-302	Cloud Computing	4	-	-	4.0	40	60	-	100
3.	Core	MCA-303	Advanced Computer Architecture	3	1	-	4.0	40	60	-	100
4.	Specialization	MCA-304	Elective – I	3	-	-	3.0	40	60	-	100
5.	Specialization	MCA-305	Elective – II	3	1	-	4.0	40	60	-	100
6.	Core	MCA-306	Programming with Python Lab.	-	-	2	2.0	60	-	40	100
7.	Core	MCA-307	Cloud Computing Lab.	-	-	2	1.0	60	-	40	100
8.	Specialization	MCA-308	Lab. based on Elective – I	-	-	2	1.0	60	-	40	100
9.	Skill Enhancement Course	MCA-309	Industry Internship Viva-Voce	-	-	-	4.0	60	-	40	100
			Total	17	2	6	27.0	440	300	160	900

Note: Student can replace two subjects in a semester from the MOOC courses (SWAYAM) with the same credits of the replaced subject.

Students can choose any one of the following elective for MCA-304 and MCA-305:

Elective – I

- i) MCA-304 (a): Advanced Java Programming
- ii) MCA-304 (b): Mobile Application Development
- iii) MCA-304 (c): NoSQL Database

Elective – II

- i) MCA-305 (a): Artificial Intelligence
- ii) MCA-305 (b): Software Project Management
- iii) MCA-305 (c): Cryptography & Network Security

MCA – 4th Semester

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Skill Enhancement Course	MCA-401	Industrial Project	-	-	-	16.0	100	-	300	400
2.	General	MCA-402	General Fitness & Professional Aptitude	-	-	-	4.0	-	-	-	200
Total				-	-	-	20.0	100	-	300	600

OR

Sr. No.	Course Category	Course Code	Course Title	Teaching Load			Credits	Examination Marks			
				L	T	P		Internal	Theory	Practical	Total
1.	Specialization	MCA-401	Machine Learning	4	-	-	4.0	40	60	-	100
2.	Specialization	MCA-402	Open Source Technologies using PHP	4	-	-	4.0	40	60	-	100
3.	Specialization	MCA-403	Elective – III	4	1	-	5.0	40	60	-	100
4.	Specialization	MCA-404	Elective – IV	4	1	-	5.0	40	60	-	100
5.	Specialization	MCA-405	Open Source Technologies using PHP Lab.	-	-	2	1.0	60	-	40	100
6.	Specialization	MCA-406	Project-II	-	-	2	1.0	60	-	40	100
Total				16	2	4	20.0	280	240	80	600

Students can choose any one of the following elective for MCA-403 and MCA-404:

Elective – III

- i) MCA-403 (a): Blockchain Technology
- ii) MCA-403 (b): Computer Graphics
- iii) MCA-403 (c): Design and Analysis of Algorithms

Elective – IV

- i) MCA-404 (a): Big Data
- ii) MCA-404 (b): Data Mining and Warehousing
- iii) MCA-404 (c): Internet of Things