



# MCKV INSTITUTE OF ENGINEERING

NAAC Accredited Grade "A" Autonomous Institute under UGC Act, 1956  
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 243 G.T. Road (N), Liluah, Howrah- 711204, West Bengal, India  
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## Part II: Course Structure & Semester wise Credit Distribution

First Semester (First Year)							
Mandatory Induction Program- 3 Weeks Duration							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-M101	Mathematics-I	3	1	0	4
2	BS	BS-PH101	Physics	3	1	0	4
3	ES	ES-CS101	Programming for Problem Solving	3	0	0	3
4	HM	HM-HU103	Inculcation of Human Values and Professional Ethics (Mulya Prava)	2	0	0	2
<i>Total Theory</i>				<b>11</b>	<b>2</b>	<b>0</b>	<b>13</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	BS	BS-PH191	Physics Laboratory	0	0	3	1.5
2	ES	ES-CS191	Programming for Problem Solving Laboratory	0	0	4	2
3	ES	ES-ME191	Engineering Graphics and Design	0	0	4	2
4	AU	AU171	NSS/NCC	2	0	0	0
<i>Total Practical/ Sessional/ Audit Course</i>				<b>2</b>	<b>0</b>	<b>11</b>	<b>5.5</b>
<b>Total of First Semester</b>				<b>13</b>	<b>2</b>	<b>11</b>	<b>18.5</b>

Second Semester (First Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-M201	Mathematics-II	3	1	0	4
2	BS	BS-CH201	Chemistry	3	0	0	3
3	ES	ES-EE201	Basic Electrical and Electronics Engineering	2	1	0	3
4	HM	HM-HU201	Communication Skill (Jeevan Kaushal-I)	2	0	0	2
5	HM	HM-HU202	Introduction to Indian Knowledge System (Indian Knowledge System-I)	2	0	0	2
<i>Total Theory</i>				<b>12</b>	<b>2</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	BS	BS-CH291	Chemistry Laboratory	0	0	3	1.5



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2	ES	ES-EE291	Basic Electrical and Electronics Engineering Laboratory	0	0	4	2
3	ES	ES-ME292	Workshop/Manufacturing Practices	0	0	4	2
4	HM	HM-HU291	Communication Skill Laboratory	0	0	2	1
5	PW	PW-BS281	Ideation Laboratory	0	0	2	1
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>15</b>	<b>7.5</b>
<b>Total of Second Semester</b>				<b>12</b>	<b>2</b>	<b>15</b>	<b>21.5</b>



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Third Semester (Second Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-M301	Mathematics -III	3	0	0	3
2	BS	BS-M303	Vedic Math (Indian Knowledge System-II)	2	0	0	2
3	ES	ES-EC301	Digital Electronics	3	0	0	3
4	PC	PC-CS301	Data Structures and Algorithms	3	1	0	4
5	HM	HM-HU301	Universal Human Values-II (Jeevan Kaushal-IV)	2	0	0	2
<i>Total Theory</i>				<b>13</b>	<b>1</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	ES	ES-EC391	Digital Electronics Laboratory	0	0	4	2
2	PC	PC-CS391	Data Structures Laboratory	0	0	4	2
3	PC	PC-CS392	Python for Problem Solving Laboratory	0	0	4	2
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>12</b>	<b>6</b>
<b>Total of Third Semester</b>				<b>13</b>	<b>1</b>	<b>12</b>	<b>20</b>



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Fourth Semester (Second Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-M403	Basics of Indian Astronomy (Indian Knowledge System-III)	2	0	0	2
2	ES	ES-EC401	Signals and Systems	3	0	0	3
3	PC	PC-CS401	Discrete Mathematics	3	0	0	3
4	PC	PC-CS402	Computer Organization and Architecture	3	0	0	3
5	PC	PC-CS403	Design and Analysis of Algorithms	3	0	0	3
6	PC	PC-CS404	Operating Systems	3	0	0	3
<i>Total Theory</i>				<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	PC	PC-CS492	Computer Organization and Architecture Laboratory	0	0	3	1.5
2	PC	PC-CS493	Algorithms Laboratory	0	0	4	2
3	PC	PC-CS494	Operating Systems Laboratory	0	0	3	1.5
3	PW	PW-CS481	Mini Project	0	0	4	2
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>14</b>	<b>7</b>
<b>Total of Fourth Semester</b>				<b>17</b>	<b>0</b>	<b>14</b>	<b>24</b>



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Fifth Semester (Third Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-M503	Introduction to Indian Astronomy (Indian Knowledge System-IV)	2	0	0	2
2	PC	PC-CS501	Object-oriented Programming	3	0	0	3
3	PC	PC-CS502	Formal Language and Automata Theory	3	0	0	3
4	PC	PC-CS503	Machine Learning	3	0	0	3
5	PC	PC-CS504	Software Engineering	3	0	0	3
6	HM	HM-HU503	Leadership and Management Skills (Jeevan Kaushal-III)	2	0	0	2
<i>Total Theory</i>				<b>16</b>	<b>0</b>	<b>0</b>	<b>16</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	PC	PC-CS591	Object-oriented Programming Laboratory	0	0	3	1.5
2	PC	PC-CS593	Machine Learning Laboratory	0	0	3	1.5
3	PC	PC-CS595	Cloud Management Laboratory	0	0	4	2
4	HM	HM-HU571	Aptitude Skill Development - I	1	0	0	1
<i>Total Practical/ Sessional/ Audit Course</i>				<b>1</b>	<b>0</b>	<b>10</b>	<b>6</b>
<b>Total of Fifth Semester</b>				<b>17</b>	<b>0</b>	<b>10</b>	<b>22</b>

Sixth Semester (Third Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-CS601	Database Management System	3	0	0	3
2	PC	PC-CS602	Computer Networks	3	0	0	3
3	PC	PC-CS603	Compiler Design	3	0	0	3
4	PC	PC-CS604	Introduction to Cyber Security	3	0	0	3
5	HM	HM-HU603	Professional Skill (Jeevan Kaushal-II)	1	0	0	1
<i>Total Theory</i>				<b>13</b>	<b>0</b>	<b>0</b>	<b>13</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	PC	PC-CS691	Database Management	0	0	4	2



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			System Laboratory				
2	PC	PC-CS692	Computer Networks Laboratory	0	0	4	2
3	HM	HM-HU693	Professional Skill (Jeevan Kaushal-II) Laboratory	0	0	2	1
4	PW	PW-CS681	Project-I	0	0	4	2
5	HM	HM-HU671	Aptitude Skill Development - II	1	0	0	1
6	AU	AU671	Environmental Science	2	0	0	0
<i>Total Practical/ Sessional/ Audit Course</i>				<b>3</b>	<b>0</b>	<b>14</b>	<b>8</b>
<b>Total of Sixth Semester</b>				<b>16</b>	<b>0</b>	<b>14</b>	<b>21</b>



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Seventh Semester (Fourth Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-BIO703	Biology for Engineers	2	0	0	2
2	PE	PE-CS701	Professional Elective - I	3	0	0	3
3	PE	PE-CS702	Professional Elective - II	3	0	0	3
4	OE	OE-XXXXX	Open Elective - I	3	0	0	3
<i>Total Theory</i>				<b>11</b>	<b>0</b>	<b>0</b>	<b>11</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	PW	PW-CS781	Project-II	0	0	6	3
2	PW	PW-CS782	Summer Internship	0	0	6	3
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>12</b>	<b>6</b>
<b>Total of Seventh Semester</b>				<b>11</b>	<b>0</b>	<b>12</b>	<b>17</b>

Eighth Semester (Fourth Year)							
Sl. No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PE	PE-CS801	Professional Elective - III	3	0	0	3
2	HM	HM-HU803	Entrepreneurship and Start-ups	2	0	0	2
3	OE	OE-XXXXX	Open Elective - II	3	0	0	3
4	OE	OE-XXXXX	Open Elective - III	3	0	0	3
<i>Total Theory</i>				<b>11</b>	<b>0</b>	<b>0</b>	<b>11</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	PW	PW-CS881	Project-III	0	0	8	4
2	PW	PW-CS882	Comprehensive Viva voce	0	0	2	1
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>10</b>	<b>5</b>
<b>Total of Eighth Semester</b>				<b>11</b>	<b>0</b>	<b>12</b>	<b>16</b>



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## Part III: Specializations and corresponding List of Elective Papers

### A. Specialization in Advanced Machine Intelligence

Sl. No.	Semester	Course Code	Course Name	Course Title	Contact Hours			Credits
					L	T	P	
<b>Theory</b>								
1	VII	PE-CS701A	Professional Elective-I	A. Artificial Intelligence B. Neural Network and Deep Learning	3	0	0	3
2	VII	PE-CS702A	Professional Elective-II	A. Image Processing and Computer Vision B. Natural Language processing	3	0	0	3
3	VIII	PE-CS801A	Professional Elective-III	A. Generative AI B. Reinforcement Learning	3	0	0	3
<i>Total Theory</i>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
<b>Practical/ Sessional/ Audit Course</b>								
1					0	0	0	0
<i>Total Practical/ Sessional/ Audit Course</i>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>



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B. Specialization in Advanced Computing								
Sl. No.	Semester	Course Code	Course Name	Course Title	Contact Hours			Credits
					L	T	P	
<b>Theory</b>								
1	VII	PE-CS701B	Professional Elective-I	A. High Performance Computing B. Advanced Computer and GPU Architecture	3	0	0	3
2	VII	PE-CS702B	Professional Elective-II	A. Cloud Computing B. Edge Computing	3	0	0	3
3	VIII	PE-CS801B	Professional Elective-III	A. Quantum Computing B. Distributed System	3	0	0	3
<i>Total Theory</i>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
<b>Practical/ Sessional/ Audit Course</b>								
1					0	0	0	0
<i>Total Practical/ Sessional/ Audit Course</i>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>

C. Specialization in Intelligent and Secure Information Systems								
Sl. No.	Semester	Course Code	Course Name	Course Title	Contact Hours			Credits
					L	T	P	
<b>Theory</b>								
1	VII	PE-CS701C	Professional Elective-I	A. Soft Computing B. Pattern Recognition	3	0	0	3
2	VII	PE-CS702C	Professional Elective-II	A. Data Mining B. Big Data Analytics	3	0	0	3
3	VIII	PE-CS801C	Professional Elective-III	A. Blockchain Technologies B. Information Security	3	0	0	3
<i>Total Theory</i>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
<b>Practical/ Sessional/ Audit Course</b>								
1					0	0	0	0
<i>Total Practical/ Sessional/ Audit Course</i>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>



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## Part IV: List of Open Elective Papers

Open Elective Papers offered by CSE department								
Sl. No.	Semester	Course Code	Course Name	Course Title	Contact Hours			Credits
					L	T	P	
<b>Theory</b>								
1	V	OE-CS501A	Open Elective-I	Introduction to Python Programming	2	0	0	2
2	VI	OE-CS601A	Open Elective-II	Data Structures and Algorithms	2	0	0	2
3	VII	OE-CS701A	Open Elective-III	Database Management System	2	0	0	2
4	VII	OE-CS701B		Object-oriented Programming	2	0	0	2
5	VIII	OE-CS801A	Open Elective-IV	Machine Learning	2	0	0	2
<i>Total Theory</i>					<b>10</b>	<b>0</b>	<b>0</b>	<b>10</b>
<b>Practical/ Sessional/ Audit Course</b>								
1	V	OE-CS591A	Open Elective-I	Introduction to Python Programming Laboratory	0	0	2	1
2	VI	OE-CS691A	Open Elective-II	Data Structures Laboratory	0	0	2	1
3	VII	OE-CS791A	Open Elective-III	Database Management System Laboratory	0	0	2	1
4	VII	OE-CS791B		Object-oriented Programming Laboratory	0	0	2	1
5	VIII	OE-CS891A	Open Elective-IV	Machine Learning Laboratory	0	0	2	1
<i>Total Practical/ Sessional/ Audit Course</i>					<b>0</b>	<b>0</b>	<b>10</b>	<b>5</b>
<b>Total</b>					<b>10</b>	<b>0</b>	<b>10</b>	<b>15</b>



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## Part V: Curriculum Structure for Minor Degree

### A. Minor Degree in Advanced Web Development

Sl. No.	Semester	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	IV	MN-CS401A	Fundamentals of Front-end Development	4	0	0	4
2	V	MN-CS501A	Server-Side Programming	4	0	0	4
3	VI	MN-CS601A	Advanced Front-end Development	4	0	0	4
4	VII	MN-CS701A	Fundamentals of Deployment	2	0	0	2
<i>Total Theory</i>				<b>14</b>	<b>0</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	IV	MN-CS491A	Fundamentals of Front-end Development Laboratory	0	0	2	1
2	V	MN-CS591A	Server-Side Programming Laboratory	0	0	2	1
3	VI	MN-CS691A	Advanced Front-end Development Laboratory	0	0	2	1
4	VII	MN-CS791A	Fundamentals of Deployment Laboratory	0	0	6	3
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>12</b>	<b>6</b>
<b>Total</b>				<b>14</b>	<b>0</b>	<b>12</b>	<b>20</b>



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B. Minor Degree in Quantum Technologies							
Sl. No.	Semester	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	IV	MN-CS401B	Foundations of Quantum Computing: Physics, Engineering, and Mathematics Computing	4	0	0	4
2	V	MN-CS501B	Survey of Quantum Technologies and Applications	4	0	0	4
3	VI	MN-CS601B	Foundations of Quantum Technologies	4	0	0	4
4	VII	MN-CS701B	Introduction to Quantum Communication	4	0	0	4
<i>Total Theory</i>				<b>16</b>	<b>0</b>	<b>0</b>	<b>16</b>
<b>Practical/ Sessional/ Audit Course</b>							
1	IV	MN-CS491B	Computational Skills and Numerical Modelling Lab	0	0	2	1
2	V	MN-CS591B	Advanced Physics and Quantum Optics Laboratory	0	0	2	1
3	VI	MN-CS691B	Electronic Measurement Laboratory for Quantum Technology	0	0	2	1
4	VII	MN-CS791B	Quantum Algorithms and Quantum Machine Learning Lab	0	0	2	1
<i>Total Practical/ Sessional/ Audit Course</i>				<b>0</b>	<b>0</b>	<b>8</b>	<b>4</b>
<b>Total</b>				<b>16</b>	<b>0</b>	<b>4</b>	<b>20</b>



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## Additional: List of Open Elective Papers for CSE Program

Open Elective Papers planned to be offered to students of CSE Program								
Sl. No.	Semester	Course Code	Offered by	Course Title	Contact Hours			Credits
					L	T	P	
<b>Theory</b>								
1	VII	OE-EC701B	ECE	Internet of Things	3	0	0	3
		OE-IT701D	IT	Cyber law and Security Policy				
		OE-EE701B	EE	Control System				
2	VIII	OE-EC801C	ECE	Adhoc Sensor Network	3	0	0	3
		OE-M801A	BS-M	Operations Research and Optimizing Technique				
		OE-IT801A	IT	E-Commerce				
3	VIII	OE-EE801B	EE	Renewable Energy	3	0	0	3
		OE-EE801C	EE	Electric Vehicle				
		OE-HM802A	HM	Business Intelligence				
<i>Total Theory</i>					<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>