



# MCKV INSTITUTE OF ENGINEERING

NAAC Accredited "A" Grade Autonomous Institute under UGC Act 1956  
 Approved by AICTE & affiliated to Maulana Abul Kalam Azad University of Technology, West Bengal  
 243 G.T. Road (N), Liluah, Howrah- 711204, West Bengal, India  
 Ph: +91 33 26549315/17 Fax +91 33 26549318 Web: www.mckvie.edu.in

## Curriculum for Undergraduate Degree (B.Tech.) in Electronics and Communication (VLSI Design) (w.e.f. AY: 2020-21)

### 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-PH101	Physics	3	1	0	4
2	BS	BS-M101	Mathematics-I	3	1	0	4
3	ES	ES-EE101	Basic Electrical and Electronics Engineering	3	1	0	4
4	HM	HM-HU101	English	2	0	0	2
<i>Total Theory</i>				<b>11</b>	<b>3</b>	<b>0</b>	<b>14</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	BS	BS-PH191	Physics Laboratory	0	0	3	1.5
2	ES	ES-EE191	Basic Electrical and Electronics Engineering Laboratory	0	0	4	2
3	ES	ES-ME191	Engineering Graphics and Design	1	0	4	3
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>1</b>	<b>0</b>	<b>11</b>	<b>6.5</b>
<b>Total of First Semester</b>				<b>12</b>	<b>3</b>	<b>11</b>	<b>20.5</b>

Second Semester (First Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	BS	BS-CH201	Chemistry	3	1	0	4
2	BS	BS-M201	Mathematics-II	3	1	0	4
3	ES	ES-CS201	Programming for Problem Solving	3	0	0	3
<i>Total Theory</i>				<b>9</b>	<b>2</b>	<b>0</b>	<b>11</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	BS	BS-CH291	Chemistry Laboratory	0	0	3	1.5
2	ES	ES-CS291	Programming for Problem Solving Lab	0	0	4	2



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3	ES	ES-ME292	Workshop/ Manufacturing Practices	1	0	4	3
4	HM	HM-HU291	Language Laboratory	0	0	2	1
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>1</b>	<b>0</b>	<b>13</b>	<b>7.5</b>
<b>Total of Second Semester</b>				<b>1</b>	<b>2</b>	<b>13</b>	<b>18.5</b>
				<b>0</b>			

Third Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-EC302	Analog Electronic Circuits	3	0	0	3
2	PC	PC-EC303	Signals and Systems	3	0	0	3
3	PC	PC-EC304	Network Theory	3	0	0	3
4	ES	ES-CS301	Data Structure and Algorithm	3	0	0	3
5	ES	ES-CS302	Discrete Mathematics	3	0	0	3
6	BS	BS-M304	Numerical Methods	2	0	0	2
<i>Total Theory</i>				<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	PC	PC-EC392	Analog Electronic Circuits Lab	0	0	2	1
2	PC	PC-EC394	Network Theory Lab	0	0	2	1
3	ES	ES-CS391	Data Structure Lab	0	0	2	1
4	BS	BS-M394	Numerical Methods Lab	0	0	2	1
5	MC	MC371	Environmental Sciences	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>2</b>	<b>0</b>	<b>8</b>	<b>4</b>
<b>Total of Third Semester</b>				<b>19</b>	<b>0</b>	<b>8</b>	<b>21</b>

Fourth Semester (Second Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-EC402	Digital System Design	3	0	0	3
2	PC	PC-EC403	Microprocessors and Microcontrollers	3	0	0	3
3	PC	PC-EC(V)401	Analog and Digital Communication	3	0	0	3
4	PC	PC-EC(V)402	Control System	3	0	0	3
5	OE		Open Elective-I	3	0	0	3
6	BS	BS-BIO401	Biology	2	0	0	2
<i>Total Theory</i>				<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>



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Practical/ Sessional/ Mandatory Course							
1	PC	PC-EC492	Digital System Design Lab.	0	0	2	1
2	PC	PC-EC493	Microprocessors and Microcontrollers Lab	0	0	2	1
3	PC	PC-EC(V)491	Analog and Digital Communication Lab	0	0	2	1
4	OE		Open Elective-I (Lab)	0	0	2	1
5	HM	HM-HU491	Soft Skill Development Lab	0	0	2	1
6	MC	MC472	Constitution of India	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>2</b>	<b>0</b>	<b>10</b>	<b>5</b>
<b>Total of Fourth Semester</b>				<b>19</b>	<b>0</b>	<b>10</b>	<b>22</b>

List of Elective Courses	
<b>Open Elective-I</b>	
OE- EC(V)401A	Python Programming
OE- EC(V)401B	Object Oriented Programming
<b>Open Elective-I (Lab)</b>	
OE- EC(V)491A	Python Programming Lab
OE- EC(V)491B	Object Oriented Programming Lab

Fifth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-EC(V)501	Analog VLSI Circuits	3	0	0	3
2	PC	PC-EC(V)502	Computer Architecture	3	0	0	3
3	PC	PC-EC501	Electromagnetic Waves and Transmission Line	3	0	0	3
4	PC	PC-EC504	Digital Signal Processing	3	0	0	3
5	PE	PE-EC(V)501	Professional Elective-I	3	0	0	3
6	HM	HM-HU502	Value and Ethics in Profession	2	0	0	2
<i>Total Theory</i>				<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	PC	PC-EC(V)591	Analog VLSI Circuits Lab	0	0	2	1
2	PC	PC-EC(V)592	Computer Architecture Lab	0	0	2	1
3	PC	PC-EC591	Electromagnetic Waves and Transmission Line Lab	0	0	2	1
4	PC	PC-EC594	Digital Signal Processing Lab	0	0	2	1



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5	MC	MC571	Aptitude Skill Development-I	2	0	0	0
6	MC	MC573	Essence of Indian Traditional Knowledge	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>4</b>	<b>0</b>	<b>8</b>	<b>4</b>
<b>Total of Fifth Semester</b>				<b>21</b>	<b>0</b>	<b>8</b>	<b>21</b>

List of Elective Courses	
<b>PE-EC(V)501</b>	<b>Professional Elective-I</b>
PE-EC(V)501A	Microelectronics and Optoelectronic Devices
PE-EC(V)501B	Advanced Microprocessors

Sixth Semester (Third Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-EC(V)601	Microelectronics Fabrication	3	0	0	3
2	PC	PC-EC(V)602	Digital VLSI	3	0	0	3
3	PE	PE-EC(V)601	Professional Elective-II	3	0	0	3
4	PE	PE-EC(V)602	Professional Elective-III	3	0	0	3
5	OE		Open Elective-II	3	0	0	3
<i>Total Theory</i>				<b>15</b>	<b>0</b>	<b>0</b>	<b>15</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	PC	PC-EC(V)692	Digital VLSI Lab	0	0	2	1
2	PE	PE-EC(V)691	Professional Elective-II (Lab)	0	0	2	1
3	OE		Open Elective-II (Lab)	0	0	2	1
4	PW	PW-EC(V)681	Mini Project	0	0	3	1.5
5	MC	MC671	Aptitude Skill Development-II	2	0	0	0
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>2</b>	<b>0</b>	<b>9</b>	<b>4.5</b>
<b>Total of Sixth Semester</b>				<b>17</b>	<b>0</b>	<b>9</b>	<b>19.5</b>

List of Elective Courses	
<b>PE-EC(V)601</b>	<b>Professional Elective-II</b>
PE- EC(V)601A	Computer Network
PE- EC(V)601B	Instrumentation and Measurement
<b>PE-EC(V)602</b>	<b>Professional Elective-III</b>
PE-EC(V)602A	Sensors and Transducers



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PE-EC(V)602B	MEMS
	<b>Open Elective-II</b>
OE-CS601B	Artificial Intelligence
OE-IT601A	Machine Learning
<b>PE-EC(V)691</b>	<b>Professional Elective-II (Lab)</b>
PE-EC(V)691A	Computer Network Lab
PE-EC(V)691B	Instrumentation and Measurement Lab
	<b>Open Elective-II (Lab)</b>
OE-CS691B	Artificial Intelligence Lab
OE-IT691A	Machine Learning Lab

Seventh Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PC	PC-EC(V)701	Embedded Systems	3	0	0	3
2	PE	PE-EC(V)701	Professional Elective-IV	3	0	0	3
3	OE		Open Elective-III	3	0	0	3
4	HM	HM-HU701	Economics for Engineers	3	0	0	3
<i>Total Theory</i>				<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	PC	PC-EC(V)791	Embedded Systems lab	0	0	2	1
2	PW	PW-EC(V)781	Design Lab	0	0	4	2
3	PW	PW-EC(V)782	Project -I	0	0	6	3
4	PW	PW-EC(V)783	Seminar	0	0	2	1
5	PW	PW-EC(V)784	Industrial Training	During Semester Break(6 <sup>th</sup> & 7 <sup>th</sup> )			1
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>0</b>	<b>0</b>	<b>14</b>	<b>8</b>
<b>Total of Seventh Semester</b>				<b>12</b>	<b>0</b>	<b>14</b>	<b>20</b>

List of Elective Courses	
<b>PE-EC(V)701</b>	<b>Professional Elective-IV</b>
PE-EC(V)701A	VLSI Design Automation
PE-EC(V)701B	Nano Electronics
	<b>Open Elective-III</b>
OE-IT701F	Web Technology



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OE-CS701E	Cyber Security
OE-M701A	Operations Research and Optimizing Technique

Eighth Semester (Fourth Year)							
Sl No.	Category	Course Code	Course Name	Contact Hours			Credits
				L	T	P	
<b>Theory</b>							
1	PE	PE-EC(V)801	Professional Elective-V	3	0	0	3
2	PE	PE-EC(V)802	Professional Elective-VI	3	0	0	3
3	OE		Open Elective-IV	3	0	0	3
4	HM	HM-HU801	Organizational Behaviour	3	0	0	3
<i>Total Theory</i>				<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>
<b>Practical/ Sessional/ Mandatory Course</b>							
1	PW	PW-EC(V)881	Project-II	0	0	9	4.5
2	PW	PW-EC(V)882	Comprehensive Viva Voce	0	0	0	1
<i>Total Practical/ Sessional/ Mandatory Course</i>				<b>0</b>	<b>0</b>	<b>9</b>	<b>5.5</b>
<b>Total of Eighth Semester</b>				<b>12</b>	<b>0</b>	<b>9</b>	<b>17.5</b>

List of Elective Courses	
<b>PE-EC(V)801</b>	<b>Professional Elective-V</b>
PE-EC(V)801A	Low Power VLSI
PE-EC(V)801B	Processor Architecture for VLSI Design
<b>PE-EC(V)802</b>	<b>Professional Elective-VI</b>
PE-EC(V)802A	Renewable Energy
PE-EC(V)802B	Speech and Audio Processing
	<b>Open Elective-IV</b>
OE-IT801C	Internet of Things (IoT)
OE-CS801C	Big Data Analytics
OE-HU801D	Entrepreneurship