

**Indian Institute of Technology Patna**

**Electrical Engineering Department**

**Dual Degree in VLSI and Embedded Systems**

**Course Curriculum**

**Semester-1**

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	CE111	Engineering Drawing	1	0	3	2.5
2	EE101	Electrical Sciences	3	1	0	4
3	HS103	Communicative English for Engineers	2	0.5	1	3
4	MA101	Mathematics-I	3	1	0	4
5	ME110	Workshop	0	0	3	1.5
6	PH103	Physics	3	1	0	4
7	PH110	Physics Laboratory	0	0	3	1.5
		NCC/NSS/NSO	0	0	0	0
		<b>Total</b>	<b>12</b>	<b>3.5</b>	<b>10</b>	<b>20.5</b>

**Semester-2**

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	CH101	Introduction to Chemistry	3	1	0	4
2	CS101	Programming and Data Structure	3	0	0	3
3	CS110	Programming and Data Structure Lab	0	0	3	1.5
4	EE103	Electrical Sciences Lab	0	0	3	1.5
5	MA102	Mathematics-II	3	1	0	4
6	ME102	Engineering Mechanics	3	1	0	4
7	CB102 & CE	Biology and Environmental Studies	3	0	0	3
	CH110	Chemistry Laboratory	0	0	3	1.5
		NCC/NSS/NSO	0	0	0	0
		<b>Total</b>	<b>15</b>	<b>3</b>	<b>9</b>	<b>22.5</b>

### Semester 3

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	EExxx	Measurements and Instrumentation	3	0	0	3
2	EE200	Electronic Devices and Circuits	3	0	0	3
3	EE201	Digital Electronics and Microprocessor	3	0	0	3
4	EE221	Signals and Systems	3	0	0	3
5	XX2nn	Open Elective-I	3	0	0	3
6	HS2nn	HSS Elective	3	0	0	3
7	EE202	Digital Circuits and Microprocessor Lab	0	0	3	1.5
		<b>Total</b>	<b>18</b>	<b>0</b>	<b>3</b>	<b>19.5</b>

### Semester 4

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	HS2nn	HSS Elective I	3	0	0	3
2	EE2nn	VLSI Design	3	0	0	3
3	MA225	Probability Theory and Random Processes	3	1	0	4
4	EE203	Analog Circuits	3	0	0	3
5	EE205	Network Analysis and Synthesis	3	0	0	3
6	EE2xx	Computer Organization and Architecture	3	0	0	3
7	EE204	Analog Circuits Lab	0	0	3	1.5
		<b>Total</b>	<b>18</b>	<b>1</b>	<b>3</b>	<b>20.5</b>

### Semester 5

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	XX3nn	Open Elective-II	3	0	0	3
2	EExxx	Microcontroller and Embedded System	3	0	0	3
3	EE3nn	Control Systems –I	3	0	0	3
4	EE3xx	Department Elective - I	3	0	0	3
5	EExxx	Analog Communication	3	0	0	3
6	EE3xx	Engineering Electromagnetics	3	0	0	3
7	EE3xx	Intelligent Systems Lab	0	0	3	1.5
8	EExxx	Engineering Electromagnetics Lab	0	0	3	1.5
		<b>Total</b>	<b>18</b>	<b>0</b>	<b>6</b>	<b>21</b>

### Semester 6

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	HS3nn	HSS Elective II	3	0	0	3
2	EE3xx	Digital Communications	3	0	0	3
3	EE3nn	Mathematical Methods for Engineers	3	0	0	3
4	EE3xx	Department Elective - II	3	0	0	3
5	EE320	Digital Signal Processing	3	0	0	3
6	EE311	VLSI Lab	0	0	3	1.5
7	EE321	Digital Signal Processing Lab	0	0	3	1.5
8	EE3xx	Analog and Digital Communications Lab	0	0	3	1.5
		<b>Total</b>	<b>15</b>	<b>0</b>	<b>9</b>	<b>19.5</b>

### Semester 7

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	XXnnn	Open Elective-III	3	0	0	3
2	EE511	Digital VLSI System	3	0	0	3
3	EE512	Embedded System	3	0	0	3
4	EE5xx	Departmental Elective – III	3	0	0	3
5	EE5xx	Departmental Elective – IV	3	0	0	3
6	EE5xx	Departmental Elective – V	3	0	0	3
7	EE515	VLSI System Lab	0	0	3	1.5
		<b>Total</b>	<b>18</b>	<b>0</b>	<b>3</b>	<b>19.5</b>

### Semester 8

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	EE513	Analog and Mixed Signal System	3	0	0	3
2	EE514	High Performance Computing System	3	0	0	3
3	EE5xx	Departmental Elective – VI	3	0	0	3
4	EE5xx	Departmental Elective – VII	3	0	0	3
5	EE5xx	Departmental Elective – VIII	3	0	0	3
6	EE5xx	Seminar	0	0	0	2
7	EE516	Embedded System Lab	0	0	3	1.5
		<b>Total</b>	<b>15</b>	<b>0</b>	<b>3</b>	<b>18.5</b>

### Semester 9

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	EE6xx	Project Part – I	0	0	0	15
2	EE6xx	Grand Viva	0	0	0	4
		<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>

## Semester 10

Sl. No	Course Code	Course name	Credit Structure			
			L	T	P	C
1	EExxx	Project Part – II	0	0	0	21
2						
		<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>
		<b>Grand Total</b>	<b>129</b>	<b>7.5</b>	<b>46</b>	<b>201.5</b>

### Elective Courses:

#### Code Course Title

EE505	VLSI Testing and Verification
EE506	Fault Tolerant Systems
EE507	Modeling & Simulation of MOS Devices
EE508	Intelligent Visual Surveillance System
EE509	VLSI DSP
EE510	FPGA Based system Design
EE520	Advanced Digital Signal Processing
EE525	Digital Image Processing
EE527	Pattern Recognition and applications
EE540	Radio Frequency Integrated Circuits
EE563	VLSI Architectural Design and Implementation
EE570	Real time and Embedded Operating Systems
EE571	Network on Chip
EE572	Low Power Circuits and Systems
EE573	VLSI Technology
EE574	Bio Sensors and Circuits
EE575	Embedded System Integration
EE576	System-on-Programmable-Chip Design
EE577	Sensors and Actuators
EE578	MEMS
CS557	Cryptography
CS509	Cyber Physical Systems
CS528	CAD for VLSI
CS553	Hardware Security
PH515	MEMS & NEMS
EE543	Internet of Things
CS564	Foundations of Machine Learning