

**Indian Institute of Technology Patna**

**Electrical Engineering Department**

**Dual Degree in Signal Processing & Communication 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	EExxx	Advance Digital Signal Processing	3	0	0	3
3	EExxx	Information Theory and Coding	3	0	0	3
4	EExxx	Departmental Elective – III	3	0	0	3
5	EExxx	Departmental Elective – IV	3	0	0	3
6	EExxx	Departmental Elective – V	3	0	0	3
7	EExxx	Signal Processing 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	EExxx	Advanced Digital Communication	3	0	0	3
2	EExxx	Wireless Communication	3	0	0	3
3	EExxx	Departmental Elective – VI	3	0	0	3
4	EExxx	Departmental Elective – VII	3	0	0	3
5	EExxx	Departmental Elective – VIII	3	0	0	3
6	EExxx	Seminar	0	0	0	2
7	EExx	Communication 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	EExxx	Project Part – I	0	0	0	15
2	EExxx	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:

#### Semester 7

1. EE523-Advanced Bio-Medical Signal Processing
2. EE525-Digital Image Processing
3. EE527- Pattern Recognition and Applications
4. EE532- Optical Communication
5. EE535-Communication Network
6. EE538-Satellite Communication
7. EE543-Internet of Things
8. EE561- Antenna Theory and Design
9. EE563-VLSI Architectural Design and Implementation
10. EE 587- A First Course in Optimization
11. CS564-Foundations of Machine Learning
12. MA525- Operations Research

+Relevant electives from other/EE departments pertaining to signal processing, communication, machine and deep learning.

## Semester 8

1. EE526-Digital Video Processing
  2. EE528-Deep learning for video surveillance
  3. EE537-Optical Networks
  4. EE562-Embedded Computing Systems and Interfacing
  5. EE539-Multimedia Communication
  6. EE555-Random Signals & Stochastic Processes
  7. EE565-Telecommunication Management
  8. EE5xx-Emerging Wireless Technologies
  9. EE5xx-Pattern Recognition and Machine Learning (Newly added elective)
  10. MA502-Numerical Optimization
  11. EExxx-Silicon Photonics (Newly added elective)
- + Relevant electives from other/EE departments pertaining to signal processing, communication, machine and deep learning.